

The American Midland Naturalist

Devoted to Natural History,

Primarily that of the Prairie States

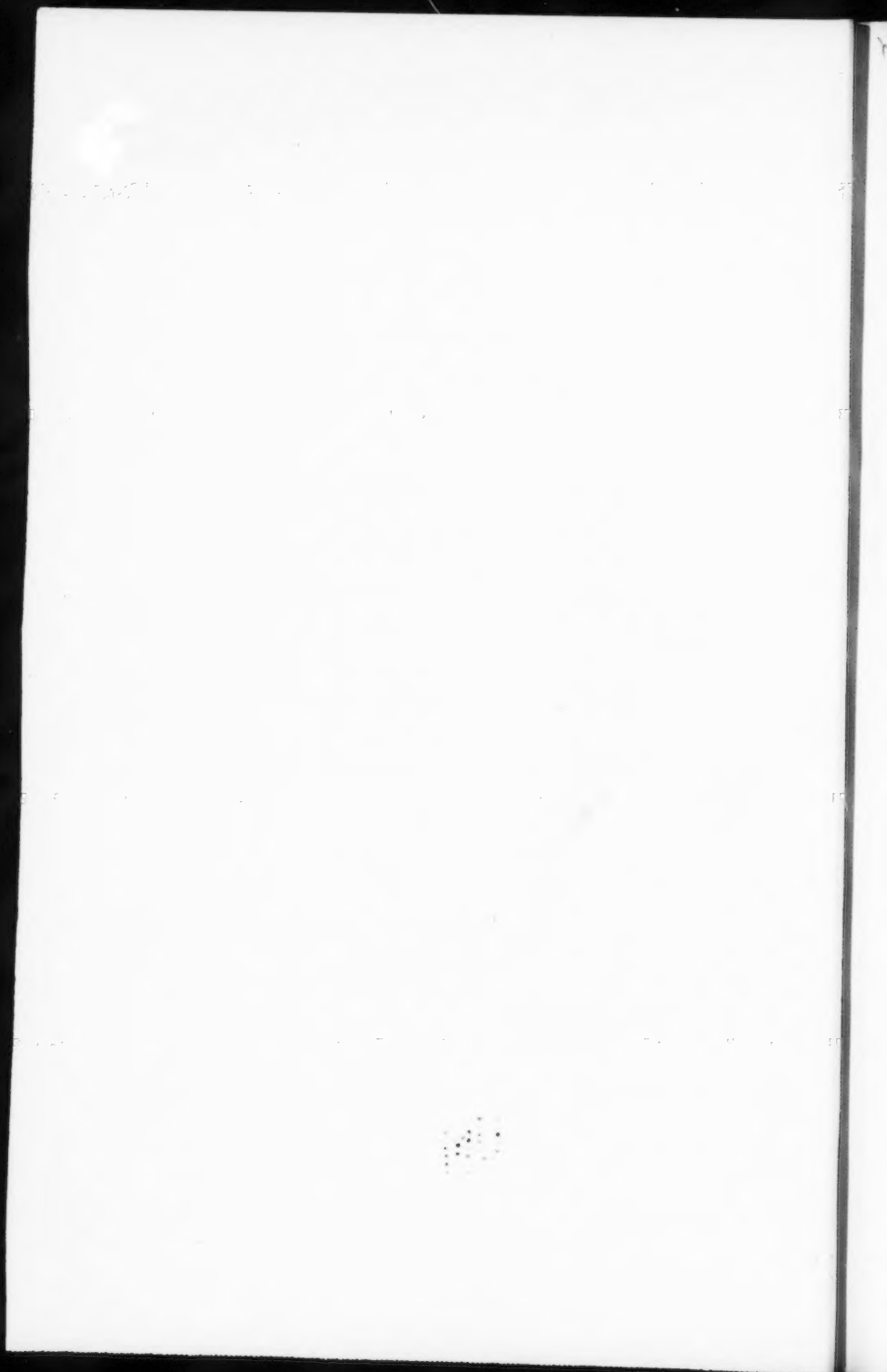
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VOL. XV.—1934

UNIVERSITY OF NOTRE DAME
NOTRE DAME, INDIANA



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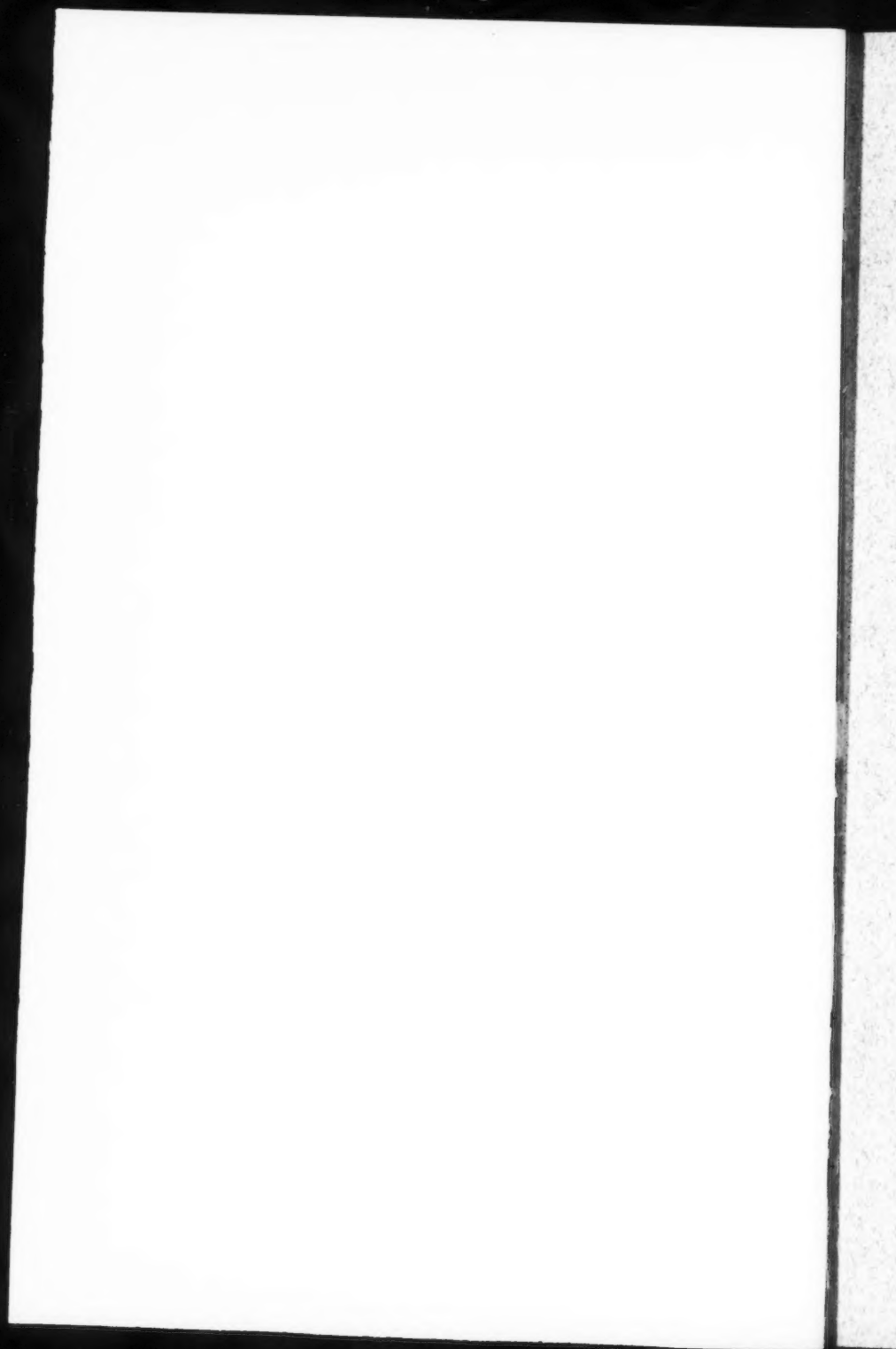
Dates of Publication

Volume XV : 1934

Number 1 January	February 15
Number 2 March	March 17
Number 3 May	July 31
Number 6 July	August 1
Number 5 September	September 11
Number 6 November	November 20

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The following numbers are out of print: vol. I, 1, 8; vol. II, 1, 2, 8; vol. III, 1, 2, 3, 7, 9; vol. IV, 1-7; vol. VI, index, title page; vol. X, index, title page; vol. XI, 1. All others available, 30 cents per copy. Complete volumes: \$3.00; volumes VII, XIII and XIV, \$1.50 each.

Beginning with January, 1934: single issues, 35c each; complete volumes, \$2.00 each.

For any other information address THE ASSISTANT EDITOR, Notre Dame, Indiana.

Entered as second-class matter at Notre Dame, Indiana. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized on July 3, 1918.

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PUBLISHED BI-MONTHLY BY THE UNIVERSITY OF NOTRE DAME,
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No. 1

THE LEA HERBARIUM AND THE FLORA OF CINCINNATI

E. LUCY BRAUN

- I. INTRODUCTION
- II. GEOGRAPHICAL TREATMENT
- III. HABITATS AND PLANT COMMUNITIES
- IV. COMPARISON OF THE FLORAS OF 1840 AND 1930
 - Introduced Plants
 - Native Plants of Interest
- V. TAXONOMIC NOTES
- VI. SYSTEMATIC LIST
- VII. CATALOG OF THE VASCULAR PLANTS OF CINCINNATI AND VICINITY

I.—Introduction

In the early days of Cincinnati, Ohio, when that city was only one-twelfth as large as now, and occupied but a fraction of the present area, Thomas G. Lea, a careful and enthusiastic local botanist, was studying the flora of the region. During the years 1834-1844, he built up an herbarium which has since become the property of the Academy of Natural Sciences of Philadelphia. Lea's collections included not only the vascular plants, but also mosses, liverworts, and fungi including lichens. Only the vascular plants of the Lea Herbarium are included in the present paper.

This herbarium now includes 1056 sheets, of 714 species, in a beautiful state of preservation. Each sheet bears Lea's original label, and on a large proportion there are also critical and valuable notes made at the time of collection. A few of these are reproduced and will serve to give to the student an idea of what may be expected on consulting this material.

It had been Lea's plan to prepare a local flora, but his untimely death prevented its fulfillment. "Mr. Lea died of an autumnal fever, on the 30th of September 1844, at Waynesville in this State, where he had been passing a few weeks, making . . . many new and rare collections in the adjacent valley of the Little Miami River." In 1849, a catalogue of Lea's collections appeared, prepared by his brother, Isaac Lea, "in accordance with instructions left me by my late brother, Thomas G. Lea."* This early catalogue—a list of species—is all that is available concerning this valuable early collection from the Ohio valley.

* Catalogue of Plants, Native and Naturalized, collected in the Vicinity of Cincinnati, Ohio, during the years 1834-1844, by Thomas G. Lea. Philadelphia. 1849.

The very explicit localities given on Lea's labels, and the habitat notes, have made it possible to determine with certainty the place of many of the collections and something of the environment, and form the basis of the geographical and habitat treatments in this paper.

The writer undertook the review of the Lea Herbarium at the suggestion of Dr. Francis W. Pennell of the Academy of Natural Sciences of Philadelphia, and to him thanks are due for the rare opportunity of extended study on this material. Specimens in some groups have been referred to specialists, and to each of these due acknowledgments are made.

II.—Geographical Treatment

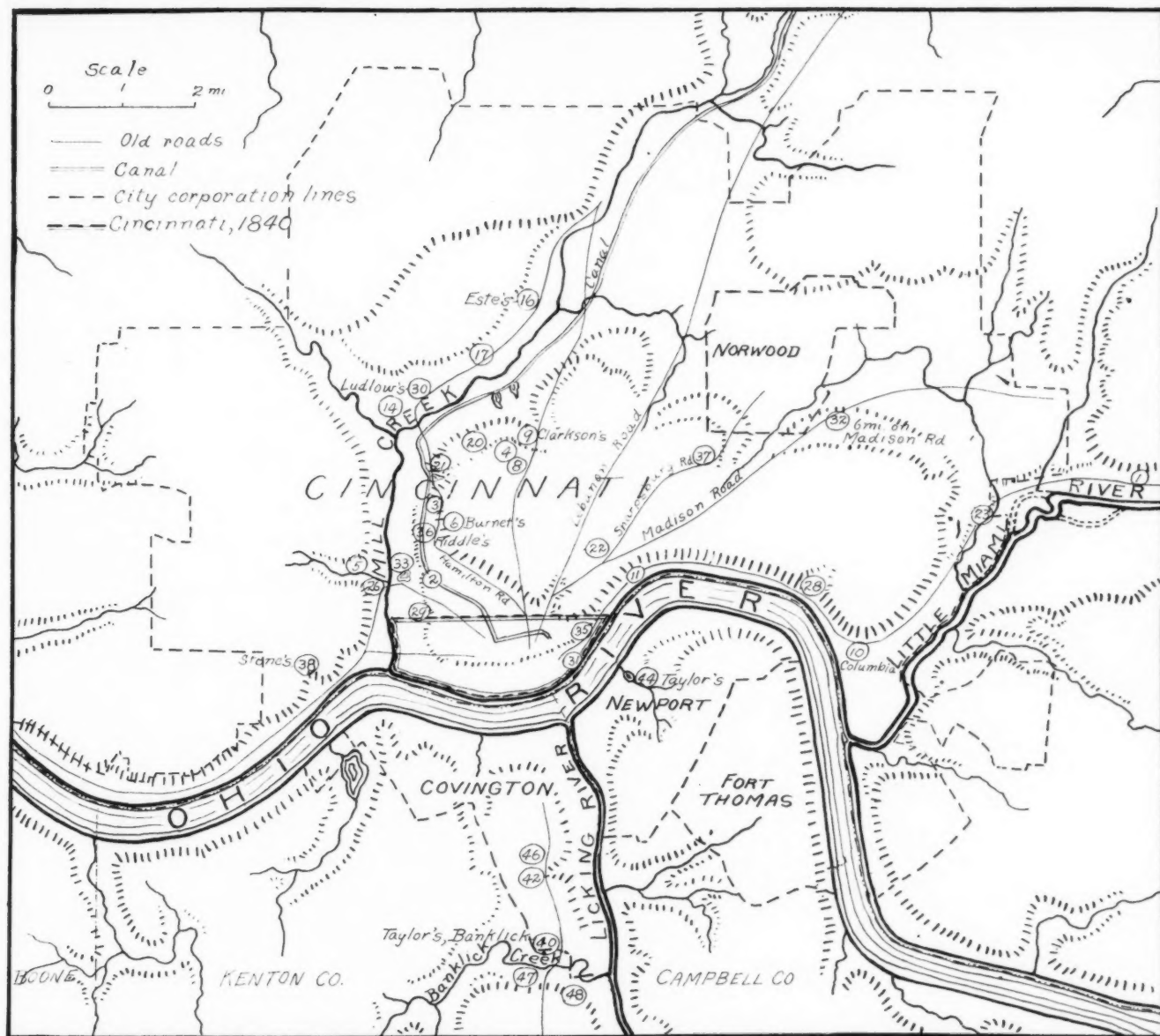
Since the making of the Lea Herbarium, tremendous changes have taken place in the environs of Cincinnati. The rich collecting grounds of 1840 are the factory sites of today. Habitats, briefly described in words, and amply demonstrated by groups of specimens, are utterly destroyed, and with them, their characteristic flora.

At Cincinnati, two streams enter the Ohio River: Mill Creek from the north, and the Licking River from the south. About the mouth of the Licking and between it and Mill Creek is a terrace some two miles in width. Beyond this, rise the higher hills which border the Ohio. (see map). In 1840 the city occupied only a portion of this terrace. The bordering hills were wooded or farm land, and the broad valley of Mill Creek, now a factory section of the city for twelve miles of its length, was partly farm, but largely wooded or swamp land. The accompanying map shows the present corporation lines of Cincinnati and adjacent cities, and the approximate boundary of Cincinnati in 1840. Due to the small size of the city, the nearby wooded valleys, bluffs and hills presented to the early botanists a rich collecting ground which is no longer available. On the other hand, the lack of transportation, and the small number of roads of those days, reduced the availability of much of the country, and are strongly reflected in the marked concentration of localities visited along the few radiating highways.

Following is a list of localities mentioned by Lea, and the number of specimens secured from each. It will readily be seen, that while many localities were visited, a few yielded the majority of the specimens. These are described in greater detail under the consideration of habitats. So far as possible, the location of Lea's collecting grounds is indicated on the map by numerals corresponding to the list. Most of the localities visited were within six miles of the present center of the city and consequently have suffered greatly from the city's growth.

Locality*	No. specimens	Locality	No. specimens
1. Armstrong's	4	5. Bullock's	5
2. Barnard's	1	6. Burnet's	16
3. Barnet's	1	7. Canal	4
4. Bryan's	2	8. Cassily's	3

* Numbers 1 to 38 inclusive are in Hamilton County, Ohio; numbers 39, 40, 41, 42, 46, 47, 48 are in Kenton County, Ky.; numbers 44 and 45 are in Campbell County, Ky.



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Locality	No. specimens	Locality	No. specimens
9. Clarkson's	55	30. Ludlow's	94
10. Columbia	5	31. Ludlow's, Ohio River shore	2
11. Corbin's	2	32. Madison road, 6 mi. out;	
12. Cornish's		7 mi. out	31
13. Correy's	2	33. Mill Creek, Mill Creek pond	18
14. Cummins ville	4	34. Ohio River shore	19
15. Dickinson's	3	35. Old reservoir	5
16. Este's	34	36. Riddle's	62
17. Garrard's	4	37. Sharpsburg road	1
18. Gilmore's	1	38. Stone's	43
19. Hay's Orchard	1	39. Baptist Brick kiln, Covington	3
20. Hills, 2, 3, 3½ mi. N;		40. Banklick Crk, Banklick flat, Bank-	
2, 3, 3½ NW	32	lick dam, Taylor's Banklick	100
21. Howell's basin	1	41. Covington	3
22. Lane Seminary	1	42. Levapour's	8
23. Langdon's	1	43. Licking River	4
24. Lebanon road		44. Newport, incl. Taylor's dam,	
25. Mrs. Lee's	4	ravine and woods	39
26. Lehman's	1	45. Pleasant Run	2
27. Little Miami River, pond near		46. Wallace's	4
mouth, and Little Miami hills	12	47. Watson's	2
28. Longworth's	3	48. Williamson's	8
29. Loring's	1		

III.—Habitats and Plant Communities

The location of collecting grounds, even though these are now covered by paved streets and factories, gives some suggestion of former habitat. The meager habitat notes on the original labels are frequently suggestive, and when combined with topography and soil type of the spot sometimes give very definite ideas of former conditions. By grouping the specimens according to locality, and habitats within these, it has been possible, in many cases, to reconstruct a picture of the original vegetation.

The outlying parts of Cincinnati today, and the neighboring sections are varied in topography and soil types. Each supports its characteristic plant communities.* Alluvial flood plains of the larger streams—Ohio, Miami, Little Miami, Licking rivers, and Mill Creek—have their flood plain vegetation of forests, swamps and dwindling ponds. The glacial terraces bordering these streams interruptedly, support vegetation suited to the sandy or gravelly soils. The river hills, for the most part steep and rocky, are forest clad—though little is original forest. The rolling uplands with their network of ravines present a variety of habitats in which in places natural vegetation remains. Farther from Cincinnati, in the counties to the east, the flat and undissected till plains, with wet and acid soil, support a series of distinct communities whose only equivalent within Cincinnati is to be found in local spots on present and pre-glacial valley flats.

A comparison of plant communities of today with those of Lea's time as built up from the lists of specimens, shows a former continuance over most

* Braun, E. Lucy. 1916. The Physiographic Ecology of the Cincinnati Region. Ohio Biological Survey, Bull. 7.

of the present site of Cincinnati, of vegetation essentially the same as the surrounding vegetation of today. This is to be expected. But in places the degree of difference from present communities is sufficiently striking to warrant some conjecture as to former conditions.

At present, mesophytic forest of the climax type is very limited in extent, for it occupied land that was good farm land, and later good residence property. This was apparently the prevailing community of Lea's time, for many of its herbaceous plants occur in the herbarium with no locality and only the note "in woods." Among these we find *Dryopteris hexagonoptera*, *Polygonatum commutatum*, *Vagnera racemosa*, *Trillium declinatum*, *Hydrastis canadensis*, *Actaea alba*, *Caulophyllum thalictroides*, *Geranium maculatum*, *Asarum canadense*, *Monotropa uniflora*, *Hydrophyllum macrophyllum*, *Eupatorium urticaefolium*, and others—characteristic plants of our mesophytic forests, some of them today very rare, due to the greatly reduced area of such forests. With no other group of plants is this lack of locality so evident. It can have only one meaning—the kind of woods where these plants grew predominated; localities were unessential. If we select what are today among the rarest of plants of the mesophytic forest we find support for the probable prevalence of this forest. A specimen of the showy orchis, *Orchis spectabilis*, bears the note "plenty."

A small percentage of the plants of steep wooded hills—the xero-mesophytic forest of river slopes—are without notes as to locality. Among these we find *Quamasia hyacintha*, *Saxifraga virginiensis* ("dry woods"), *Cercis canadensis* ("woods, hilly"), *Viola sororia* ("dry thickets and open woods"), *Dodecatheon Meadia* and *Senecio obovatus*, most of which are still abundant slope forest plants. We may probably correctly surmise that the hills bordering the city abounded in these plants.

Other types of habitats appear to have been much more restricted in extent, then, as now, for with each, is the locality. Some swamp plants have no other note than "wet"; probably swamps abounded then in the several valleys. Now they are few. The more important habitats only, will be considered in this discussion.

The utilization of flood plain land has led to great restriction of its vegetation, and in fact, to the complete disappearance of many species from the local flora. The valley of Mill Creek formerly contained ponds evidently of sufficient size and permanence for definite aquatic communities. *Ceratophyllum demersum*, *Potamogeton foliosus*, *Sparganium americanum*, *Eleocharis obtusa*, *Utricularia minor* and *Nymphaea advena* are noted from "Mill Creek pond." The last two of these are no longer represented in our flora. In the Licking River were a few hydrophytes, among them *Heteranthera dubia*, not since recorded from the region. The Miami and Erie Canal through Mill Creek valley, and the "basins" along it, were important sources of aquatics and swamp plants. *Potamogeton pectinatus*, *P. foliosus*, *Batrachium circinatum* and many species of *Carex* and *Cyperus* were collected in these places. The ponds of the Ohio River flood plain at Columbia, near the mouth of the Little Miami, and Longworth's pond, yielded *Naias flexilis*, *Heteranthera reniformis*, *Potamogeton compressus*, *Ceratophyllum demersum* and *Nelumbo*

lutea among the aquatics, only the last two of which are now known from our flora, the last from only one pond. *Eleocharis acicularis*, *Fimbristylis autumnalis*, *Panicularia septentrionalis*, *Rotala ramosior*, *Isnardia palustris*, *Ammannia coccinea* and *Hibiscus militaris* are swamp plants from this area. The last two are probably extinct here. *Hibiscus* has not been recorded for forty-five years, and *Ammannia* not since Lea's catalogue. The only later record for *Eleocharis acicularis* is 1911, from approximately the place of Lea's collection. Of all the hydrophytic habitats visited by Lea, only two of the canal basins, and a swamp area at Columbia (Turkey Bottoms), now remain in such condition as to support some natural vegetation.

Banklick Creek, in Kenton County, Kentucky, with its hills, wet meadow and flats, was a prolific source of specimens for Lea. Little now remains to indicate its former condition. The "hills over Banklick" and other nearby hills apparently were clad with a xero-mesophytic forest. Several of its plants are absent or very rare in the region now, as *Cypripedium parviflorum pubescens*, *Astragalus carolinianus*, *Polygala Senega* var. *latifolia*, *Ceanothus americanus*, *Angelica villosa*, *Pedicularis canadensis* and *Polymnia Uvedalia*.

"Banklick flat" and meadows were apparently the acid soil valley flats so poorly represented in the region today. Floristically, they are most like the undrained upland communities of the undrained till plains to the east of Cincinnati. In the forest were *Quercus bicolor*, *Q. palustris*, *Q. imbricaria*, *Q. velutina* and *Acer rubrum*, trees of flats and undrained depressions. *Dryopteris noveboracensis*, now found in the pin oak flats to the east of Cincinnati, grew in these woods. The meadows seem to have had much in common with the forest openings and meadows of the uplands as we know them today. *Blephariglossis* (*Habenaria*) *peramoeba*, *Scirpus cyperinus*, *Cardamine bulbosa*, *Alsine longifolia* and *Dasystephana* (*Gentiana*) *Saponaria* are today almost confined to the acid upland flats. Species of *Scirpus* and *Carex*, *Ranunculus hispidus*, *Aster Tradescanti*, *Bidens comosa*, and *Euthamia graminifolia*, were also found in this hydro-mesophytic community. *Lobelia cardinalis*, *Glycine Apios* and *Hypericum prolificum* (bearing the label "Banklick") probably belonged in this community. *Trautvetteria carolinensis*, found in this area, has not since been recorded.

Somewhat similar, was an area (in what is now Oakley) "6 mi. out on Madison Road," where "swamp white oak woods," "wet woods" and "meadow," indicate both by name and specimens collected from these spots, acid soil flats. This area is in a pre-glacial valley and is flat and poorly drained. A few large trees, white oak, swamp white oak and shell-bark hickory remain in suburban properties, doubtless in or near the area visited by Lea. The only tree specimen from this locality is *Quercus bicolor*. *Ilex verticillata*—a characteristic shrub of the upland hydro-mesophytic forest today—was here. The herbaceous plants included: *Ophioglossum vulgatum*, *Osmunda regalis*, *Panicularia septentrionalis*, *Panicum microcarpon*, *Eleocharis capitata* (*E. tenuis*), *Carex crinita*, *C. squarrosa*, *C. typhina*, *Juncus effusus*, *J. marginatus*, *J. brachycarpus*, *J. acuminatus*, *Rhexia virginica*, *Myosotis macrosperma*, *Galium tinctorum*, *Houstonia coerulea* and *Mitchella repens*,—plants of the upland hydro-mesophytic forest, and for the most part, absent from the immediate

vicinity of Cincinnati. *Baptisia leucantha* was found here, and has not since been recorded from the region.

Stone's, including such habitats as "hilly woods," "bank of rocky rivulet," "Stone's hill," and "brow of hill," was located on the southeast edge of what is now Price Hill, overlooking the Ohio River, near Mt. Echo Park. This is the only one of Lea's collecting grounds on the bluffs of the Ohio. Most of the plants collected there are species now common on the river hills, plants of the oak-ash-maple forest. The trees and shrubs collected there—*Acer nigrum*, *Celtis occidentalis*, *Hicoria cordiformis*, *Viburnum rufidulum*, and several species of *Crataegus*, *C. punctata*, *C. pratensis*, *C. pruinosa*—are, except the maple, secondary species in this association. The herbaceous plants from this location, as *Hystrix patula*, *Bromus purgans*, *Trillium sessile*, *Thalictrum dioicum*, *Synedemon thalictroides*, *Ranunculus hispidus*, *R. micranthus*, *Cardamine purpurea*, *Jeffersonia diphylla*, *Cubelium concolor*, *Triosteum aurantiacum* and *Aster Shortii* are all plants now found abundantly on the river hills—not in this location, but a mile or two farther from the city. Three of Lea's plants from Stone's—*Porteranthus stipulatus*, *Lathyrus venosus* and *Phaca neglecta*—are no longer in our region. In view of the large area of habitat similar to Stone's which still remains in semi-natural condition, the absence of these species is more unexpected than is the absence of plants from other areas which have no counterpart in the region today. It is probable that the two legumes grew in the sandy soil of a bit of terrace low on the face of the hill, as both were found near the house.

Riddle's, on the hills east of Mill Creek (just west of where the University of Cincinnati now stands) was one of the most frequently visited of Lea's collecting grounds. It was near to the city, and was reached by way of the old Hamilton Road (now McMicken Avenue). The area included thickets, fields, meadows and ponds. It contained no communities of especial interest, though two of the plants from here—*Napaea dioica* and *Valerianella Woodsiana*—are probably no longer found in the Cincinnati region.

Burnet's—including the present site of Burnet Woods Park and considerable territory to the east of it—yielded a few specimens, none rare. Its chief interest is in the partial preservation of the place as a park.

Clarkson's is one of the most interesting of Lea's collecting grounds. With this may be included the hills 3, 3½ and 4 miles north and north-west, which though not belonging to the same property, were doubtless adjacent. Here were "woods," "open woods" and "fields." The area lies in the north part of what is now Clifton; Clarkson's extended from Glenmary Avenue to the Canal. From this area came the type specimen of *Quercus Leana*. The tree stands, a fine specimen, on the north side of Glenmary Avenue—"the left hand side going down" as noted on Lea's label. Many of the specimens of *Quercus Leana* in local herbaria are from the type tree. From the character of the herbaceous plants collected at and adjacent to Clarkson's, as well as from the remaining remnants of original vegetation, we may picture small areas of mesophytic, perhaps climax forest (indicated by *Hydrastis canadensis*, *Smilax lasioneuron*, *Vitis cordifolia*, *Aplectrum hyemale*); larger areas

of xero-mesophytic, probably oak forest (with *Dasistoma macrophylla*, *Ceanothus americanus*, *Cynthia virginica*, *Eupatorium purpureum*, *Nabalus albus* and *Solidago ulmifolia*); and of special interest, the "open woods" and "fields" where *Lobelia leptostachys*, *Aster azureus*, *Coreopsis tripteris*, *Helianthus divaricatus*, *Phaethusa* (*Verbesina*) *helianthoides*, *Sabbatia angularis*, *Vincetoxicum Shortii*, *Eupatorium sessilifolium*, *Silphium trifoliatum*, *Sisyrinchium albidum*, *Scutellaria parvula*, indicate the existence of prairie openings or remnants of prairie openings. Nearly half of the species which Lea collected at Clarkson's and adjacent properties are now rare and some have disappeared from the region. This was an area of abrupt topography, of hills and deep ravines on an eroded glacial terrace (Illinoian) bordering a major valley. No similar area of like extent and exposure is to be found in the Cincinnati region, hence the rarity of the plants formerly found here.

Este's was the most distant locality in Mill Creek valley visited by Lea. It lay opposite the present site of Ivorydale, to the northeast of Winton Place. Here the labels indicate a variety of habitats—ponds, ditches, bog, prairie bog, prairie, and hill woods. From these places, were collected some of the most interesting plants of the Lea Herbarium, though the number of species is far less than from some other localities. Este's is on the west side of Mill Creek, in a sandy glacial soil area. There is no indication, from the specimens, that the "prairie" was true prairie; more likely it was prairie-like in aspect because of the dominance of grasses and sedges. The "bog" may have been a true bog, or a swamp. In it were *Rhus vernix*, *Dulichium arundinaceum* and *Carex rostrata*, plants of northern range which distinctly indicate the presence here of a boreal, probably bog, relic colony. With these were other sedges—*Cyperus strigosus*, *Eleocharis glaucescens*, *Carex comosa*, *C. lasiocarpa*—and plants of wet places, *Ranunculus septentrionalis*, *Rumex Brittanica*, *Boehmeria cylindrica scabra* and *Valerianella radiata*. About one-fourth of the plants which Lea collected at Este's are now probably extinct in the Cincinnati region.

Ludlow's, also on the west side of Mill Creek, but about two miles below Este's, contained a wide variety of habitats, some of unusual interest. A part of the property lay on the flood plain of Mill Creek in the present location of Cumminsville. Remnants of sandy terrace and hills of glacial drift border the flood plain on west and north. No site in the region could be more ideally located as to soil and water supply, for several large springs formerly emerged here; and nowhere can we find its counterpart today. Lea's labels bear a large variety of designations for plants collected at this place: bog, cornfield bog, saw-mill bog, far springy bog, *Cypripedium* bog, bog prairie, ditches, sandy fields, dry banks, thicket, swamp, meadow, wooded bank; for some there is no habitat, just the locality—Ludlow's.

The plants collected at Ludlow's indicate clearly the presence of patches of true prairie, probably in the form of prairie openings on steep hillsides. Here were *Silphium terebinthinaceum*, *Ratibida pinnata*, *Gentiana quinquefolia*, *Psoralea Onobrychis*, and perhaps *Lepedeza violacea* and *Solidago speciosa*. The absence from the herbarium of the grasses which might be expected to accompany these plants, as *Andropogon scoparius* and *Sorghas-*

trum nutans, may have been due to oversight in collecting, loss of material, or may indicate that the openings were nearly crowded out and represented by only scattered plants of the above mentioned species.

Among the communities of wetter soil, the "Cypripedium bog" stands out as the most remarkable spot visited by Lea. Beautiful specimens of *Cypripedium reginae* (*C. hirsutum*), collected June 7, and June 22, 1837 establish a record for the occurrence of this northern orchid, ninety miles south of the present southernmost station in Ohio. With the orchids were *Carex prairea* (northern), *C. interior*, *C. laevi-vaginata*, *Helianthus grosse-serratus* and *Aster puniceus*. Other rather northern species from the several "bogs" at Ludlow's as *Caltha palustris*, *Spathyema foetida*, *Campanula aparinoides*, *Synosma suaveolens* and *Carex suberecta*, may be included in the composition of this boreal relic colony. The "bogs" seem to have been the black mucky and sandy spots which may be found about some springs emerging from certain deposits of glacial age.

The flood plain swamps, ditches and meadow at Ludlow's yielded a hydrophytic flora distinct from that of the "bogs." Here were *Zannichellia palustris*, *Philotria minor*, *Tradescantia reflexa*, *Sium cicutae-folium*, *Veronica catenata glandulosa*, *Solidago patula*, *Cirsium muticum* and perhaps *Oxy-polis rigideus*, plants of wide range in contrast to the more northern "spring swamp" species.

Comparatively few woodland plants were collected from Ludlow's. These are of various community affiliations, both mesophytic and xero-mesophytic. Nearly one hundred species of the Lea Herbarium are from this place. About one-third of these are now rare or extinct in the region.

IV.—Comparison of the Floras of 1840 and 1930

An exact comparison of the Cincinnati flora of 1840 with that of the present time cannot be made. The area covered by Lea now contains few species; a larger area—the Cincinnati and vicinity of today—includes some habitats never reached by Lea. On the other hand, some of Lea's habitats have been completely destroyed by the advance of the city, and with them, their plants.

The flora of 1840, as considered here, is the flora of the areas visited by Lea—areas for the most part within six miles of the center of the city. The flora of 1930, as considered here, includes the plants of an area within a radius of about twenty miles of the center of Cincinnati, except that to the south, the boundary of the Cincinnati topographic sheet is used. This area includes all of Hamilton County, about one-third of Clermont County, and smaller parts of Butler and Warren counties in Ohio, and that part of Campbell, Kenton and Boone counties in Kentucky, within the area of the Cincinnati topographic sheet.

Any list of the present flora of the Cincinnati region is the result of the combined records of all the collectors in the region. The list here presented contains 1302 species and varieties, of which 70 are probably extinct. About seven or eight per cent of the vascular plants recorded by Lea are probably

extinct in the region. Four and one-half per cent have not been recorded in any list later than Lea's.

INTRODUCED PLANTS

The present flora contains a much higher percentage of introduced plants than did the flora of 1840. While only about six per cent of the species collected by Lea are introduced plants, about twenty per cent of the species now listed for the region are introduced. Some of the commonest of our introduced weeds probably had not reached this region ninety years ago. The common chickweed, *Stellaria media*, is not in the Lea Herbarium. *Daucus Carota*, a weed on roadsides and in fields and wasteland everywhere, was first recorded in the region in 1891 (Lloyd catalogue). At that date, too, we have our first published record of *Pastinaca sativa*, *Torilis anthriscus*, *Lysimachia Nummularia*, *Linaria vulgaris* and *Galinsoga parviflora*, all now very common and widely scattered. The date of the first published record is not, however, to be taken as even the approximate date of introduction, for at least four of these plants first recorded in 1891 (*Daucus Carota*, *Pastinaca sativa*, *Linaria vulgaris*, and *Lysimachia Nummularia*) are represented by herbarium specimens (in the writer's possession) of the date of 1870.

It seems probable then, that the lower percentage of introduced plants in the Lea Herbarium is due partly to a lower percentage in the region at that time, and partly to failure to collect weeds. Some species that Lea collected, as *Chenopodium Botrys* and *Inula Helenium*, have never increased in quantity. Others, unusual in Lea's time, have become common. Of these, may be mentioned: *Lithospermum arvense*, collected May 12, 1840, at Newport, Ky., with the note "This is the first time I have found this plant here, and this is the beginning of its being introduced;" and *Hypericum perforatum*, 1842, with the note "This has not been found in the vicinity of Cincinnati until now, when I collected it in Este's wet prairie, on the bank of a ditch where it is growing luxuriantly in a patch of 6 or 8 feet. It will doubtless spread and become a troublesome weed to farmers."

Ranunculus sceleratus. Although this plant is now common around Cincinnati in wet places, Lea did not find it. In Gray's Manual, is the statement: "sometimes appearing as if introduced." As Lea frequented wet places of the sort where the plant now grows, it is probable that it was not here, and has since been introduced.

NATIVE PLANTS OF INTEREST

Certain notes concerning abundance or rarity of species are of interest in connection with the present flora.

Acorus Calamus. June 20, 1842. "Riddle's wet meadow about $\frac{1}{2}$ a mile beyond the Brighton house. I have found this in no other place about Cin.. I am told by J. Clark that Col. Riddle informed him that he had brought plants from a distance more than thirty years ago and put them down in this spot. They have continued to increase and now cover more than $\frac{1}{4}$ of an acre. It is singular that it has not spread into other places."

This species is not uncommon about Cincinnati at the present time. It is particularly characteristic of swampy ground near the heads of streams on the upland. It does not occur in the running swamps in valleys, such as Lea frequented; so far as can be ascertained, there is now no station for this plant within the area covered by Lea. It does not seem likely that in the eighty-nine years since Lea wrote the above note, *Acorus* has spread widely about the region from plants brought in by Col. Riddle; rather, that it has always been a constituent of the stream source communities which probably were not represented within Lea's collecting territory.

Tradescantia reflexa. June 12, 1839. "At the foot of a boggy, springy bank below Garrard's farm, near a bunch of the large leaved willow and at the side of prostrate dead tree;" and, May 30, 1840, Cumminsville meadow. "It is rare here, but is abundant at Springfield, where it has the same character as ours. It flowers later than the virginica, the petals smaller, the sepals smooth, as well as the whole plant. The stem is taller, becoming very small at summit, and the whole plant has a glaucous look." This species was not again recorded until 1927, from the Cincinnati region, nor is it recorded in the state list from the vicinity of Springfield.

Trautvetteria carolinensis. July 11, 1837. "(rare) Taylor's wet meadow, Banklick" (Kenton County, Ky.). Lea's notes give height of plant as 3-4 feet, whereas both Britton and Brown and Gray give 2-3 feet, indicating that although the plant was growing at the extreme northern part of its range, it was in a very favorable habitat. It is a species of southern range not known from Ohio.

Filipendula rubra. June 12, 1839. This species has not been recorded since 1852 (Clark catalog), and is not now known to occur within seventy-five miles of Cincinnati. In almost the spot where Lea collected this plant—"boggy border of the bank below Garrard's farm"—it is now growing thriftily in cultivation, in the moist soil along the border of an artificial lake (Spring Grove Cemetery).

Cercis canadensis. April 20. "Woods, hilly." Lea's characterization of the habitat—"woods, hilly"—implies conditions different from the extensive rolling woods of his time. Redbud is not, here, a tree of "rich soil," but a tree of hillsides, most common on rocky south slopes. It is xero-mesophytic rather than mesophytic.

Floerkea proserpinacoides. May 11, 1838. "Top of hill west of Mill Creek. Collected by Mr. Clark." Lea notes: "stigma sometimes *trifid* (usually *bifid*) and the petals are conspicuously bearded at base." Concerning habitat: "Eat. Man. notices it as growing in water, and Darl. in 'miry shaded places.'—Here it has as yet been found in one station only, viz.—on the top of the hill west of Mill creek to the left of Lehman's house, in open woods among grass. It is here so plenty as to be grasped by hands-full." Our manuals still persist in assigning this plant to marshes and river banks, in which place it is never found in this region. Here it is a plant of open mesophytic woods.

Dodecatheon Meadia. No locality or habitat is given with the specimens;

they are the tall robust and many flowered form occurring here on steep dry hillsides in woods, where there is a stiff clay soil derived from the decomposition of limestone. Another form, very much smaller and fewer flowered, grows on steep slopes where the soil is sandy or pebbly. Neither form is ever found here on prairies or moist cliffs.

Asclepias tuberosa. Sept. 13, 1839. "Ludlow's sandy field going to the Laurel oak spring. This specimen is from a stem that has been cut down in an oats field, and is the only one I have seen in our vicinity." This species has always been uncommon here, although it is abundant forty miles north and seventy-five miles east, and not scarce as near as thirty miles east.

Scutellaria parvula. June 4, 1842. Clarkson's. "This is the first time I have found this—it is confined to a small space in a field with a few scattered trees next to Clarkson's woods, and between it and an old log house near the hollow." There is only one record for this species since Lea's collection; that is of specimens collected in 1908 not over a mile, if that far, from his station.

Coreopsis tripteris. Aug. 9, 1842. "Clarkson's open woods, but a single plant, and the first time it has been found in our vicinity." This is not uncommon in the counties to the east of here, but is not found in our region.

V.—Taxonomic Notes

On the original labels of a number of species of the Lea Herbarium, may be found critical notes of considerable taxonomic interest, many of which are quoted in the accompanying list. On some are excerpts from letters written by Torrey and by Nuttall. This is often the case with specimens of plants described later than Lea's time. Again, there are specimens in the Lea Herbarium, which, though they seem to belong to species as defined in the manuals, nevertheless differ from them in some details. These are indicated in the catalog.

VI.—Systematic List

The systematic list includes all vascular plants which have been recorded or are known to occur within a radius of approximately twenty miles of the center of Cincinnati. In compiling this list, previous catalogs of the local flora have been consulted. The writer's herbarium is the chief source of information for more recent records. Records not substantiated by specimens, or of which specimens were not examined, are indicated as reported by ———.

All plants of the Lea Herbarium are indicated by the six-place numbers which appear below the name. These numbers are the serial numbers of the Lea Herbarium sheets in the herbarium of the Academy of Natural Sciences. Notes from or based on the Lea Herbarium—localities, habitats or taxonomic notes—follow the numbers to which they refer.

Species probably extinct in the area covered by the list are marked by † preceding the name. Those species which are now extinct, and which were recorded by Lea only, are indicated by ‡ preceding the name.

Introduced species are indicated by §.

The nomenclature used is that of the second edition (1913) of Britton and Brown, *Illustrated Flora of the Northern United States, Canada and the British Possessions*.^{*} Exceptions to this may be found in families or genera worked by specialists; for these, the names they have applied have been used. When the names in the seventh edition (1908) of Gray's *New Manual of Botany*, or in the first edition of Britton and Brown, differ from those used in the list, they are included in small print.

Previous lists of the local flora are:

- LEA, THOMAS G.—Catalogue of plants, native or naturalized, collected in the vicinity of Cincinnati, Ohio, during the years 1834-1844. 1849.
 CLARK, JOSEPH—A catalog of flowering plants and ferns observed in the vicinity of Cincinnati, with addenda by Robert Buchanan. 1852.
 JAMES, JOSEPH F.—Catalogue of the flowering plants, ferns and fungi growing in the vicinity of Cincinnati. *Jour. Cin. Soc. Nat. Hist.* 1879.
 JAMES, DAVIS L.—Additions and corrections to the catalogue of Joseph F. James. 1881.
 LLOYD, CURTIS G.—List of plants observed growing wild in the vicinity of Cincinnati, Ohio. Lloyd Library. 1891.
 AIKEN, WALTER H.—Check list of Hamilton County, Ohio, plants, exclusive of the lower cryptogams. *Jour. Cin. Soc. Nat. Hist.* 1904.
 AIKEN, WALTER H.—Catalogue of the ferns and flowering plants of Cincinnati, Ohio, and vicinity. Lloyd Library. 1911.
 WILSON, O. T.—A key to the flowering plants of Cincinnati and vicinity. (Mimeographed, University of Cincinnati.)

VII.—Catalog of the Vascular Plants of Cincinnati and Vicinity

PTERIDOPHYTA

Ophioglossaceae

- Ophioglossum vulgatum* L. Adder's-tongue.
 619643—Ludlow's on wooded bank. Also in wet woods on Madison road.
Botrychium obliquum Muhl. Ternate Grape-fern.
 619640—Taylor's mill pond. 619642—Este's prairie, moist foot of hill.
Botrychium obliquum var. *tenuifolium* (Underw.) Gilbert.
 619641—Burnet's woods.
Botrychium obliquum var. *elongatum* Gilbert & Haberer.
Botrychium obliquum var. *oneidense* (Gilbert) Waters.
Botrychium dissectum Spreng. Cut-leaved Grape-fern.
Botrychium ternatum var. *dissectum* D. C. Eaton.
Botrychium obliquum var. *dissectum* (Spreng.) Clute.
Botrychium virginianum (L.) Sw. Virginia Grape-fern.

Osmundaceae

- Osmunda regalis* L. Royal Fern.
 619663—"From Mr. Clark's garden being transplanted from the woods six miles on the road to Madison."
 †*Osmunda cinnamomea* L. Cinnamon-fern. (Clark catalog, 1852).
 †*Osmunda Claytoniana* L. Clayton's Fern. Interrupted Fern.

^{*} The nomenclature of the second edition of Britton and Brown was followed in accordance with the wishes of Dr. F. W. Pennell of the Academy of Natural Sciences through whose courtesy the loan of the Lea Herbarium was arranged.

Polypodiaceae

- Onoclea sensibilis* L. Sensitive Fern.
 619659—Mr. Clark's garden.
- Woodsia obtusa* (Spreng.) Torr. Blunt-lobed Woodsia.
- Filix bulbifera* (L.) Underw. Bladder Fern.
Cystopteris bulbifera (L.) Bernh.
- Filix fragilis* (L.) Underw. Brittle Fern.
Cystopteris fragilis (L.) Bernh.
 619658—Taylor's ravine (Campbell Co., Ky.).
- Polystichum acrostichoides* (Michx.) Schott. Christmas Fern.
Dryopteris acrostichoides (Michx.) Kuntze.
 619661.
- Polystichum acrostichoides* var. *Schweinitzii* (Beck.) Small.
- Dryopteris noveboracensis* (L.) A. Gray. New York Fern.
Aspidium noveboracense (L.) Sw.
 619650—Damp woods, Banklick flat. (Kenton Co., Ky.)
- Dryopteris Thelypteris* (L.) A. Gray. Marsh Shield-fern.
Aspidium Thelypteris (L.) Sw.
 619651—Received from Riddell. 619652—Ludlow's, w. p.
 619653—Marsh at Ludlow's.
- †*Dryopteris Goldiana* (Hook.) A. Gray. Goldie's Fern.
Aspidium Goldianum Hook.
 619649—Watson's, over Banklick. (Kenton Co., Ky.)
- Dryopteris marginalis* (L.) A. Gray. Evergreen Wood-fern.
Aspidium marginale (L.) Sw.
- Dryopteris intermedia* (Muhl.) Gray. American Shield-fern.
Dryopteris spinulosa intermedia (Muhl.) Underw.
Aspidium spinulosum var. *intermedium* (Muhl.) D. C. Eaton.
- Dryopteris Phegopteris* (L.) C. Chr. Long Beech-fern.
Phegopteris Phegopteris (L.) Underw.
Phegopteris polypodioides Fee.
- Dryopteris hexagonoptera* (Michx.) C. Chr. Broad Beech fern.
Phegopteris hexagonoptera (Michx.) Fee.
 619660—In woods.
- Camptosorus rhizophyllus* (L.) Link. Walking-fern.
 619656—Clarkson's.
- Asplenium platyneuron* (L.) Oakes. Ebony Spleenwort.
 619654—Taylor's ravine. (Campbell Co., Ky.). 619655.
- Asplenium platyneuron* var. *serratum* (E. S. Miller) BSP.
- Asplenium Trichomanes* L. Maiden-hair Spleenwort (James catalog, 1879).
Asplenium pycnocarpon Spreng. Narrow-leaved Spleenwort.
Asplenium angustifolium Michx.
- Athyrium thelypteroides* (Michx.) Desv. Silvery Spleenwort.
Asplenium acrostichoides Sw.
 619657.
- Athyrium angustum* (Willd.) Presl. Eastern Lady-fern.
 (Usually referred to as *Athyrium* (*Asplenium*) *Filix-foemina*, a plant of Europe.
 Asia and western North America.)
 619645—Bullock's ravine. 619646—Roadside to Banklick. (Kenton Co., Ky.).
 619647—Banklick ravines towards Williamson's (Kenton Co., Ky.)
 619648—Taylor's ravine. (Campbell Co., Ky.) Leaf with aspect of western
A. Filix-foemina.
- Adiantum pedatum* L. Maiden-hair Fern.

Pteridium aquilinum (L.) Kuhn. Brake. Bracken.

Pteris aquilina L.

619662—Field . . . next the wet woods on Madison road.

Pellaea atropurpurea (L.) Link.

Polypodium virginianum L. Common Polypody.

Polypodium vulgare of Manuals, not L.

†*Polypodium polypodioides* (L.) A. S. Hitchcock. Gray Polypody. (James catalog, 1879. Schaffner catalog.)

Salviniaceae

†*Azolla caroliniana* Willd. (Schaffner catalog.)

Equisetaceae

Equisetum arvense L. Field Horsetail.

†*Equisetum sylvaticum* L. Wood Horsetail. (James catalog).

†*Equisetum fluviatile* L. Swamp Horsetail. (James catalog).

Equisetum praealtum Raf.

(Abundant; usually referred to *E. hyemale*, which species is not known to occur east of the Rocky Mountains.)

619639—Wet ground near Ludlow's and pond between Mill creek and Estes bog

Lycopodiaceae

Lycopodium lucidulum Michx. Shining Club-moss.

SPERMATOPHYTES

GYMNOSPERMAE

Pinaceae

Juniperus communis L. Juniper.

Juniperus virginiana L. Red Cedar.

ANGIOSPERMAE

Typhaceae

Typha latifolia L. Broad-leaved Cat-tail.

619664—Wet places.

Typha angustifolia L. Narrow-leaved Cat-tail.

Sparganiaceae

Sparganium eurycarpum Engelm. Broad-leaved Bur-reed.

†*Sparganium americanum* Nutt. Branching Bur-reed.

Sparganium androcladum Engelm.

619665—Ludlow's. (Fide B. Long). 619666—(Fide B. Long). 619667—Mill-creek pond. (Fide B. Long).

(Last reported in 1884).

Zannichelliaceae

Potamogeton natans L. Common Floating Pondweed.

619669—Ponds.

†*Potamogeton americanus* Cham. & Schl. Long-leaved Pondweed.

Potamogeton lonchites Tuckerm.

619668—[Probably Banklick creek, Kenton Co., Ky.]

Potamogeton foliosus Raf. Leafy Pondweed.

619670—Pond, Mill creek (plenty). 619671—Clarkson's basin. (This specimen is smaller and stouter than is No. 619670)

Potamogeton dimorphus Raf. Spiral Pondweed.

†*Potamogeton pectinatus* L. Fennel-leaved Pondweed.

619672—Canal 2-3 miles north of Cincinnati.

619673—Coll. by J. Clark, at the Yellow banks, Little Miami. (Det. by H. St. John.)

†*Potamogeton compressus* L. Eel-grass Pondweed.*Potamogeton zosterifolius* Schum.

619674—Pond near mouth of Little Miami.

†*Zannichellia palustris* L. Horned Pondweed.619675—Ditches, Ludlow's. Muddy rivulet, Este's prairie. Lea's label bears this note: "In its 2 celled anther it is like *Z. intermedia* Torr.—but in its toothed pericarp it resembles *Z. palustris*. It is not improbable that all these forms are varieties of one species."—Torr. lett. May 24-29.*Naiadaceae*†*Najas flexilis* (Willd.) Rost. & Schmidt. Slender Naias.

619676—Longworth's pond and ditch, Columbia.

*Alismaceae**Alisma subcordatum* Raf. American Water-plantain.*Alisma Plantago-aquatica* L., to which American specimens have been referred, is an Old World species.

619677.

Echinodorus cordifolius (L.) Griseb. Upright Bur-head.*Lophotocarpus calycinus* (Engelm.) J. G. Smith*Sagittaria latifolia* Willd. Broad-leaved Arrowhead.

619678—Mill creek [pistillate]. 619679—[staminate].

*Vallisneriaceae**Philotria canadensis* (Michx.) Britton. Water-weed.*Elodea canadensis* Michx.Specimens are best referred to the variety *gigantea*.*Philotria Nuttallii* (Planch.) Ryd.†*Philotria minor* (Engelm.) Small. Lesser Water-weed.

619680—In water below Ludlow's.

*Gramineae***Schizachyrium scoparium* (Michx.) Nash. Broom Beard-grass.*Andropogon scoparius* Michx.*Andropogon virginicus* L. Virginia Beard-grass. Broom-sedge.

619688—Coll. by Mr. Clark—Hay's orchard, six miles NE of Cincinnati.

Andropogon furcatus Muhl. Forked Beard-grass. Big Blue-stem.*Sorghastrum nutans* (L.) Nash. Indian-grass.*Chrysopogon avenaceus* (Michx.) Benth.§*Holcus halepensis* L. Johnson-grass.*Sorghum halepense* (L.) Pers.§*Holcus Sorghum* L. Sorghum.§*Syntherisma Ischaemum* (Schreb.) Nash. Small Crab-grass.*Digitaria humifusa* Pers.*Syntherisma linearis* (Krock.) Nash.§*Syntherisma sanguinale* (L.) Dulac. Large Crab-grass. Finger-grass.*Digitaria sanguinalis* (L.) Scop.

619705—Ohio shore.

* Grasses of the Lea Herbarium identified by Mrs. Agnes Chase.

- †*Paspalum repens* Berg. Water Paspalum.
Paspalum mucronatum Muhl.
 619751—Wet ravine below Covington. Very rare.
- Paspalum setaceum* Michx. Slender Paspalum.
Paspalum Muhlenbergii Nash.
Paspalum laeve Michx. (Aiken catalog).
Paspalum circulare Nash. Round-flowered Paspalum.
Paspalum floridanum Michx.
 §*Echinochloa Crus-galli* (L.) Beauv. Barnyard-grass.
Panicum Crus-galli L.
Panicum dichotomiflorum Michx. Spreading Witch-grass.
 619742—Cornfield, Taylor's meadow, Banklick. (Kenton Co., Ky.)
- Panicum capillare* L.
Panicum Gattingeri Nash.
 619735, 619736—Ludlow's.
Panicum flexile (Gattinger) Scribn. Wiry Witch-grass.
Panicum virgatum L. Switch-grass.
Panicum depauperatum Muhl. Starved Panic-grass. (D. L. James, 1882).
Panicum linearifolium Scribn. Low White-haired Panic-grass.
 619749—Woods next south of Clarkson's.
- Panicum polyanthes* Schultes.
Panicum dichotomum L. (D. L. James; Lloyd; Aiken).
Panicum barbulatum Michx.
 619747—Woods next to Clarkson's.
 (The plants recorded as *P. dichotomum* may belong here; the two are very similar and *P. barbulatum* is sometimes included in *P. dichotomum*.)
- Panicum microcarpon* Muhl. Barbed Panic-grass.
 619739—Meadow next swamp white oak woods six miles on Madison road.
 619746—Seven miles on Madison road.
- Panicum huachucae* Ashe. Hairy Panic-grass.
Panicum huachucae var. *sivicola* Hitch. & Chase.
 619740—Clarkson's. Banklick flat, damp woods. (Kenton Co., Ky.)
 619741—Banklick flat woods in moist places.
 619744—Taylor's field and Clarkson's woods.
 619745—Seven miles on Madison road.
 619748—Woods next to Clarkson's, south.
- Panicum latifolium* L. Broad-leaved Panic-grass.
 619743—Open woods, $3\frac{1}{2}$ miles north. 619750—Clarkson's open woods.
- Panicum Boscii* Poir.
Panicum clandestinum L. Corn Grass. Deer-tongue Grass.
 619737—Ludlow's. 619738—Ludlow's meadow.
- §*Chaetochloa verticillata* (L.) Scribn. Foxtail-grass.
Ixophorus verticillatus (L.) Nash.
Setaria verticillata (L.) Beauv.
- §*Chaetochloa lutescens* (Weig.) Stuntz. Yellow Foxtail.
Chaetochloa glauca (L.) Scribn.
Ixophorus glaucus (L.) Nash.
Setaria glauca (L.) Beauv.
 619763—Burnet's corn field.
- §*Chaetochloa viridis* (L.) Scribn. Green Foxtail.
Ixophorus viridis (L.) Nash.
Setaria viridis (L.) Beauv.

619764—Sand and gravel, Little Miami.

§*Chaetochloa italica* (L.) Scribn. Italian Millet.

Ixophorus italicus (L.) Nash.

Setaria italica (L.) Beauv.

Cenchrus carolinianus Walt. Sandbur. Bur-grass.

‡*Zizania aquatica* L. Wild Rice. (James catalog, 1879).

Homalocenchrus virginicus (Willd.) Britton. White Grass.

Leersia virginica Willd.

619731—Taylor's fern ravine. (Campbell Co., Ky.)

Homalocenchrus oryzoides (L.) Poll. Rice Cut-grass.

Leersia oryzoides (L.) Sw.

619730—Ludlow's meadow.

Phalaris arundinacea L. Reed Canary-grass.

§*Phalaris canariensis* L. Canary or Bird-seed Grass.

§*Anthoxanthum odoratum* L. Sweet Vernal-grass.

Aristida oligantha Michx. Few-flowered Aristida.

Aristida gracilis Ell. Slender Triple-awned Grass.

Aristida purpurascens Poir. (Aiken catalog, 1904, 1911).

Muhlenbergia Schreberi Gmel. Nimble Will. Dropseed-grass.

Muhlenbergia diffusa Schreb.

619732—In yard.

‡*Muhlenbergia sobolifera* (Muhl.) Trin.

619685—Woods next to Clarkson's open woods. The only place I have yet found it. (Lea) (There is no other record of this grass in this vicinity.)

Muhlenbergia mexicana (L.) Trin. Wood-grass.

619734—Taylor's ravine. (Campbell Co., Ky.)

†*Muhlenbergia tenuiflora* (Willd.) B. S. P. Slender Satin-grass.

619686—Near Banklick creek. (Kenton Co., Ky.)

Brachyelytrum erectum (Schreb.) Beauv.

619733—Stone's hillside.

§*Phleum pratense* L. Timothy.

619752—Field next to Mill creek at the two mile bridge, Barnett's.

An abnormal specimen, of which Lea wrote: "Spm. of *Phleum pratense* in which the lower palea is transformed into a leaf, the sheath enclosing the upper palea with the stamens and pistil. The ligule is visible and in all respects it resembles a leaf. It is from the second growth this season, the field having been mowed."

§*Alopecurus pratensis* L. Meadow Foxtail. (Clark catalog, 1852).

Sporobolus vaginiflorus Torr. Sheathed Rush-grass.

Sporobolus asper (Michx.) Kunth. Long-leaved Rush-grass.

Sporobolus longifolius (Torr.) Wood.

Cinna arundinacea L. Wood Reed-grass.

619699—Taylor's meadow. 619700—Cumminsville meadow in the woods.

Agrostis palustris Huds.

"*Agrostis alba* L."

619681—Hay's orchard. 619687—Field, Taylor's fern ravine. (Campbell Co. Ky.)

Agrostis perennans (Walt.) Tuckerm. Thin Grass. Upland Bent-grass.

619682—Woods next to Clarkson's open woods. 619683—Burnet's woods.

(This specimen has the divergent pedicels of *A. Schweinitzii*.)

619684—Woods near Canal basin.

Agrostis hyemalis (Walt.) B. S. P.

- §*Nothololcus lanatus* (L.) Nash. Velvet-grass.
Holcus lanatus L.
 §*Avena sativa* L. Oats.
 §*Arrhenatherum elatius* (L.) Beauv.
 619689—High bank of Licking peninsula over Levapeur's rivulet.
Danthonia spicata (L.) Beauv. Common Wild Oat-grass.
 619702—Hill about 1½ mi. over Banklick roadside.
 §*Capriola Dactylon* (L.) Kuntze. Bermuda-grass.
Cynodon Dactylon (L.) Pers.
Spartina Michauxiana Hitch. Tall Marsh-grass.
 §*Eleusine indica* (L.) Gaertn. Goose-grass. Yard-grass.
 619706—In yard.
Leptochloa filiformis (Lam.) Beauv. Slender Grass.
Leptochloa mucronata (Michx.) Kunth.
Triodia flava (L.) Hitchc. Tall Red-top.
Tridens flavus (L.) Hitchc.
Sieglingia sesleroides (Michx.) Scribn.
 619765—Ludlow's. 619766—Presbyterian burying ground.
Eragrostis capillaris (L.) Nees. Lace-grass. Tiny Love-grass.
 619716—Garden walks and beds.
Eragrostis Frankii Steud. Frank's Love-grass.
 619758—River shore.
Eragrostis pilosa (L.) Beauv.
Eragrostis caroliniana (Spreng.) Scribn.
Eragrostis Purshii Schrad.
 619757—Ohio shore at Ludlow's. 619759—Licking bank.
 §*Eragrostis Eragrostis* (L.) Karst. Low Love-grass.
Eragrostis minor Host.
 §*Eragrostis cilianensis* (All.) Link. Strong-scented Love-grass.
Eragrostis major Host.
Eragrostis megastachya (Koehler) Link.
 619754—River shore about Corbin's or above.
Eragrostis pectinacea (Michx.) Steud. Purple Love-grass.
Eragrostis hypnoides (Lam.) B.S.P. Smooth Creeping Love-grass.
 619717—River bank above Newport ferry.
 619760—Ravine toward Banklick. 619761—Pond near the race, Ludlow's.
 ‡*Sphenopholis obtusata* (Michx.) Early Bunch-grass.
Eatonia obtusata (Michx.) A. Gray.
 619728—Border of dry woods south of Clarkson's.
 619729—Woods south of Clarkson's.
Sphenopholis pallens (Spreng.) Scribn. Tall Eaton's Grass.
Eatonia pennsylvanica (DC) A. Gray.
 619725—Clarkson's woods.
 619726—Woods next south of Clarkson's.
 619724—Ditch banks, Este's wet prairie. (A somewhat large form, some spikelets four mm.)
 ‡*Sphenopholis nitida* (Spreng.) Scribn. Slender Eaton's Grass.
Eatonia nitida (Spreng.) Nash.
 619727—Woods next south of Clarkson's.
Diarrhena diandra (Michx.) Wood.
Diarina festuoides Raf.
Korycarpus arundinaceus Zea.
Korycarpus diandrus (Michx.) Kuntze.

- 619703—Hills over Banklick. 619704—Thicket bank, Riddle's field.
Uniola latifolia Michx. Broad-leaved Spike-grass.
 619767—Banklick.
 §*Dactylis glomerata* L. Orchard-grass.
 619701—Stone's hill, on the bank of the rocky rivulet.
 §*Cynosurus cristatus* L. Dog's-tail-grass.
 §*Poa annua* L. Annual or Dwarf Meadow-grass.
 §*Poa trivialis* L. Rough-stalked Meadow-grass.
Poa pratensis L. Kentucky Blue-grass.
Poa sylvestris A. Gray. Sylvan Spear-grass.
 619762—Open woods near Burnet's.
 §*Poa compressa* L. Wire-grass. English Blue-grass.
 619753—Hill back of Stone's.
Panicularia nervata (Willd.) Kuntze.
Glyceria nervata (Willd.) Trin.
 619755—Wet ravines, Riddle's. 619756—Ludlow's, wet places.
Panicularia septentrionalis (Hitchc.) Bicknell. American Flote-grass.
Glyceria septentrionalis Hitchc.
 619722—Longworth's wet meadow, Columbia. 619723—Wet places in meadow, six miles on the Madison road.
Festuca octoflora Walt. Slender Fescue-grass.
Festuca ovina L. Sheep's Fescue-grass.
 §*Festuca elatior* L. Tall or Meadow Fescue-grass.
 619718—Meadow next wet woods, seven miles on Madison road.
 619720—In Clarkson's meadow below the house. 619721—Clarkson's.
Festuca obtusa Spreng. Nodding Fescue-grass.
Festuca nutans Willd.
 619719—Open woods, Clarkson's.
 §*Bromus tectorum* L. Downy Brome-grass.
 §*Bromus sterilis* L. Barren Brome-grass.
 §*Bromus commutatus* Schrad.
 619690—Riddle's open meadow.
Bromus ciliatus L. Fringed Brome-grass.
Bromus purgans L.
 619691—Rocky bank of Banklick below the dam. 619692—Ludlow's thicket.
 619693—Ludlow's thicket. 619694—Stone's hillside facing rivulet. 619695—Banklick below the dam. 619696—Banklick.
 §*Bromus secalinus* L. Cheat. Chess.
 619697—Cassily's field. 619698—Cassily's back field.
 §*Bromus racemosus* L. Upright Chess.
 §*Bromus squarrosus* L. Corn Brome.
Lolium perenne L. Ray-grass. Rye-grass.
 §*Lolium temulentum* L. Darnel.
 §*Agropyron repens* (L.) Beauv. Couch-grass.
Hordeum nodosum L. Meadow Barley.
Hordeum jubatum L. Squirrel-tail grass.
Elymus virginicus L. Terrell-grass. Virginia Wild Rye.
 619708—Bank of Banklick. 619714—Riddle's thicket. (This specimen and No. 619715 have the awns over twice length of scales, spikes long exserted, sheaths shorter than internodes, leaves sparsely hirsute above—characters of *E. glaberrimus*.) 619715—Riddle's below copse bank.

Elymus hirsutiglumis Scribn.

Elymus australis Scribn. & Ball. Southern Wild Rye.

Elymus glabriflorus (Vasey) Scribn. & Ball.

Elymus canadensis L. Nodding Wild Rye.

619707—Rocky bank over Banklick.

Elymus striatus Willd. Slender Wild Rye.

619712—Taylor's fern ravine. (Campbell Co., Ky.)

This note appears on Lea's label: "These specimens are remarkable for having the florets scabrous but not hairy, the glumes without hairs." This is a character of *E. arkansanus* Scribn. & Ball.

619713—Riddle's copse bank above the spring.

Hystrix patula Moench. Bottle-brush Grass.

Hystrix Hystrix (L.) Millsp.

619709—Next to wet woods on Madison road. (This specimen differs from the common form here in the greater pubescence and stricter spike.)

619710—Stone's hill.

619711—Ravine in Taylor's Banklick field. (Kenton Co., Ky.)

Arundinaria tecta (Walt.) Muhl. Scutch Cane. Small Cane.

(Probably an escape, but well established in a number of locations.)

Cyperaceae*

Kyllinga pumila Michx.

619880, 619881—Moist ground.

†*Cyperus flavescens* L. Galingale. Yellow Cyperus.

619860—Wet ground, Clarkson's rivulet near the canal.

619861—At the Canal basin near Scott's ice house.

Cyperus diandrus Torr. Low Cyperus.

Cyperus rivularis Kunth. Shining Cyperus.

(Formerly included as a variety of *C. diandrus*; it is possible that specimens reported as *C. diandrus* belong here.)

619857—Springy places in Dr. Boger's old field, 3 mi. south of Covington, Ky.

619858—Este's prairie side next to the hill.

619859—Between old still house and Scott's ice house on Canal.

Cyperus inflexus Muhl. Awned Cyperus.

Cyperus aristatus Rottb.

619862—Canal. 619863—Cincinnati. 619864—In tufts in the garden in neglected beds.

Cyperus esculentus L. Yellow Nut-grass.

619865—Shore of Banklick. 619866—Canal bank. 619867.

Cyperus speciosus Vahl.

Cyperus strigosus L. Straw-colored Cyperus.

619868—Este's bog. 619869. 619870—Taylor's field at the head of fern ravine (Campbell Co., Ky.)

Cyperus lancastriensis Porter. (James catalog, 1879.)

Cyperus ovularis (Michx.) Torr. Globose Cyperus.

Eleocharis capitata (L.) R. Br. Capitute Spike-rush.

Eleocharis tenuis (Willd.) Schultes.

619878—Seven miles on Madison road.

(This plant was not recorded from the vicinity between the time of Lea's collection in 1839 and 1905; specimens of the later date came from approximately the same place as Lea's.)

* Sedges of the Lea Herbarium identified by Kenneth K. MacKenzie.

Eleocharis obtusa (Willd.) Schultes. Blunt Spike-rush.

619874—Mill creek pond. 619875—Shore of Mill creek at Gano's crossing.

61987—Taylor's wet meadow. (Kenton Co., Ky.)

(This is the common species around Cincinnati.)

Eleocharis acicularis (L.) R. & S. Needle, or Least, Spike-rush.

619872—Border of Pond, Columbia. 619873—Pond, Mill creek.

(Lea's specimens and one of the date of 1905 from the same locality as 619872 appear to be the only records from this vicinity.)

Eleocharis glaucescens (Willd.) Schultes. Creeping Spike-rush.*Eleocharis palustris* (L.) R. & S.

619877—In the ditch, upper end of Este's bog.

619879—Boggy and wet places near Saw mill, Ludlow's.

619887—Edge of saw mill corn field bog, Ludlow's.

(No record between Lea's collections and one of 1913, shore of Ohio River, Melbourne, Campbell Co., Ky.)

Fimbristylis geminata (Nees.) Kunth. Low Fimbristylis.*Fimbristylis Frankii* Steud.*Fimbristylis autumnalis* (L.) R. & S. Slender Fimbristylis.

619890—Wet gravelly shore Mill creek, Ludlow's.

619891—Edge of pond near Little Miami.

Scirpus americanus Pers. Three-square. Chair-maker's Rush.*Scirpus validus* Vahl. American Great Bulrush. Mat-rush.(Plants reported as *S. lacustris*, an Old World species, belong here.)

619884—Ludlow's bog.

Scirpus occidentalis (S. Wats.) Chase. Great Bulrush.*Scirpus atrovirens* Muhl. Dark-green Bulrush.

619883—Saw mill bog (Ludlow's) near the spring.

Scirpus georgianus Harper.

619882—Bend of rivulet above Taylor's meadow. (Kenton Co., Ky.)

Scirpus polyphyllus Vahl. Leafy Bulrush. (James catalog, 1879).*Scirpus lineatus* Michx. Reddish Bulrush.

619885—Rivulet, Taylor's field above the meadow. (Kenton Co., Ky.)

619886—Wet. 619889—Ludlow's.

Scirpus cyperinus (L.) Kunth. Wool-grass.

619888—Taylor's meadow.

Dulichium arundinaceum (L.) Britton. (Lea, 1837; Clark catalog, 1852).

619871—Este's bog, upper end.

CAREX: The list of species of *Carex* in the vicinity of Cincinnati is based entirely upon specimens in the Lea Herbarium and in the writer's herbarium, all of which were determined by Kenneth K. Mackenzie. No records from previous published lists are included as the confusion of names and recent greater differentiation of species renders such records extremely doubtful. Species represented by Lea's specimens only are indicated by an asterisk after the name.

Carex rosea Schk. Stellate Sedge.

619822—Taylor's meadow (Kenton Co., Ky.). 619823.

Carex convoluta Mackenzie.

619820—Taylor's fern ravine (Campbell Co., Ky.)

619821—Upper end of Taylor's fern ravine.

Carex cephalophora Muhl.*

619777. 619778—Field 1/2 mile beyond the Baptist brick kiln, fence side among the scattered beech trees.

- Carex Leavenworthii* Dewey.
- Carex aggregata* Mackenzie.
619847—In Mrs. Jones' yard.
- Carex sparganioides* Muhl.
619826—619827— $\frac{1}{2}$ mile beyond the Baptist brick kiln. 619828.
- Carex prairea* Dewey.*
619810—Ludlow's in the Cypripedium part of the bog.
- Carex decomposita* Muhl.*
619855.
- Carex stipata* Muhl.
- Carex laevi-vaginata* (Kukenth.) Mackenzie.
619838—Riddle's sugar tree spring. 619848—Ludlow's boggy place near where the Cypripedium grows.
- Carex bromoides* Schk.*
619774—Taylor's field. 619775.
- Carex interior* Bailey.*
Carex scirpoides Schk.
619832—Este's prairie along the ditch above the Rhus vernix; plenty.
619833—Este's prairie. 619834—Ludlow's near where Cypripedium grows, and in Este's prairie upper end near Mill creek fence.
- Carex scoparia* Schk.
- Carex tribuloides* Wahl.
619782—Taylor's meadow. (Banklick, Kenton Co., Ky.)
619783—Taylor's meadow.
- Carex cristatella* Britton.*
Carex cristata Schwein.
619784—Riddle's little bushy pond. 619785.
- Carex muskingumensis* Schw.*
619771—Riddle's pond. 619772—Riddle's bushy pond.
619773—Lea called this *Carex arida*, but with the notes: "this plant differs in several respects. . ." and "I have examined this carefully and find nothing to agree with it."
- Carex normalis* Mackenzie.*
619788—Taylor's Banklick near dam. 619789.
- Carex suberecta* (Olney) Britton.
619839—Bog, Ludlow's saw mill corn field. 619856.
- Carex Willdenovii* Schk.*
619849—Clarkson's open woods, south side.
619850—Clarkson's woods south end.
- Carex Jamesii* Schk.
619851—Lower side of Stone's rivulet along the bank in the woods; plenty.
619852—Garden. 619853.
- Carex leptalea* Wahl.
619815—Bog, saw mill corn field, Ludlow's.
- Carex communis* Bailey.*
619812—Ravine toward Banklick. (Kenton Co., Ky.)
619844—In woods hills of Banklick.
- Carex varia* Muhl.
619811—Top of cliffs, Banklick, below the dam.
619813—Knob of hill at second fork of rivulet above Taylor's dam, Newport. (Campbell Co., Ky.) 619814.

Carex hirtifolia Mackenzie.*Carex pubescens*. Muhl.

619817. 619818—Culms scattered in woods beyond Baptist brick kiln, Covington.

619819—Taylor's fern ravine. (Campbell Co., Ky.)

Carex Careyana Torr.

619776—Stone's above stone wall.

Carex digitalis Willd.*

619808—1/2 mile beyond Baptist brick kiln among beech trees.

619809—Ravine in Williamson's fields near its bottom.

Carex albusina Sheldon.*Carex laxiflora* var. *latifolia* Boott.

619769—Taylor's fern ravine. (Campbell Co., Ky.)

Carex blanda Dewey.*Carex laxiflora* var. *blanda* (Dewey) Boott.

619770—Dry beech knobs, field next to Wallace's woods.

Carex heterosperma Wahl.*Carex anceps* Muhl.*Carex granularis* Muhl.

619792—Ludlow's. 619793—Riddle's pond. 619794.

Carex oligocarpa Schk.*

619796—Ludlow's meadow.

Carex Hitchcockiana Dewey.*

619795—Taylor's fern ravine. (Campbell Co., Ky.) 619797—Back of Stone's.

Carex grisea Wahl.

619802—Taylor's fern ravine. (Campbell Co., Ky.) 619803.

Carex gracillima Schwein.

619791—On knobs about the beech trees next to Wallace's woods.

Carex prasina Wahl.

619805—Muddy rivulet next to Wallace's. 619806.

Carex Davisii Schwein. & Torr.

619786—Riddle's. 619787.

Carex Swanii (Fernald) Mackenzie.

619845—Seven miles on Madison road, border of wet woods. 619846.

Carex caroliniana Schwein.*Carex triceps* var. *Smithii* Porter.*Carex Shortiana* Dewey.

619825—Rivulet near Levapeur's orchard.

Carex Shortiana Dewey \times *typhus* Michx.

619824—Taylor's meadow moist place below the spring—a single large tuft of it. Lea called this *Carex Shortii*, but with the following note: "This is an uncommon form of it. The perigynium has a long beak giving the spike a squarrose look. The nut has not grown or ripened, the perigynium being nearly empty and bladder-like. The spikes are also larger than common and the fruit persistent. In the common form of this species, the fruit is quite caducous, falling off at the slightest touch when ripe."

Carex Emoryi Dewey.

619840—Near spring at Ludlow's house.

Carex crinita Lam.

619780—Meadow six miles on Madison road. 619781.

Carex lacustris Willd.*

619800—In ditch and on its bank, Este's boggy prairie.

Carex lanuginosa Michx.*619801—Ludlow's about where the *Cypripedium* grows.*Carex lasiocarpa* Ehrh.*

619790—Este's bog.

Carex rostrata Stokes.*

619768—Large patch, upper end of Este's bog.

Carex lurida Wahl.

619841—Near the spring, Ludlow's Saw mill corn field. 619842.

Carex hystericina Muhl.

619798—Boggy bank side below Garrard's basin. 619799.

Carex comosa Booth.*

619779—Ludlow's meadow near large hickory. 619816—Este's bog.

Carex Frankii Kunth.

619835, 619836—Cincinnati. 619837—Riddle's bushy pond—plenty.

Carex squarrosa L.

619829—Madison road seven miles out.

Carex typhina Michx.*Carex typhinoides* Schwein.

619830—Madison road meadow. 619831.

Carex intumescens Rudge.*Carex Asa-Grayi* Bailey.*Carex Grayii* Carey.

619854—Riddle's pond.

Carex lupulina Muhl.

619804—Riddle's pond.

Carex brachyglossa Mackenzie.*

619807—Meadow next the wet woods seven miles on Madison road.

Carex hirsutella Mackenzie.*

619843—Open woods and field next to Clarkson's.

Araceae

Arisaema triphyllum (L.) Torr. Jack-in-the-pulpit.

619894.

Arisaema Dracontium (L.) Schott. Green Dragon. Dragon-root.

619893.

Spathyema foetida (L.) Raf.*Symplocarpus foetidus* (L.) Nutt.

619895—Bog edge of cornfield near Ludlow's.

Acorus Calamus L. Sweet Flag. Calamus-root.

619892—Riddle's wet meadow about 1/2 mile beyond the Brighton house.

Lemnaceae

Spirodela polyrrhiza (L.) Schleid. Greater Duckweed.

619897—Ditches, Este's bog.

†*Lemna trisulca* L. Ivy-leaved Duckweed. (Clark catalog, 1852).*Lemna minor* L. Lesser Duckweed.

619896—Este's bog, in ditches.

Wolffia punctata Griseb. Dotted Wolffia.

Commelinaceae

Commelina longicaulis Jacq.*Commelina nudiflora* of authors, not L.

619898—Damp clay soil, woods 1 1/2 miles north.

619899—Shore of Licking above mouth of Banklick.

§*Commelina communis* L. Asiatic Day-flower.

Commelina virginica L. Virginia Day-flower. (James catalog, 1879).

Tradescantia virginiana L. Spiderwort.

619902—Ludlows. 619903.

Tradescantia reflexa Raf. Reflexed Spiderwort.

619901—At the foot of a boggy springy bank below Garrard's farm.

619904—Cumminsville meadow.

This plant was not recorded for the vicinity of Cincinnati from the time of Lea's collections, 1839, 1840, until 1927. It is not recorded in the State catalog (Schaffner, 1914) from the vicinity of Springfield, though found in nearby counties.

Tradescantia pilosa Lehm. Zigzag Spiderwort.

619900.

Pontederiaceae

‡*Heteranthera reniformis* R. & P. . Mud Plantain.

619905—Muddy shore of pond near Little Miami.

This plant is not recorded from Ohio in Schaffner's (1914) catalog.

‡*Heteranthera dubia* (Jacq.) MacM. Water Star-grass.

619906—Licking River five miles up at Banklick (Kenton Co., Ky.)

619907—Licking River, (submersed).

Juncaceae

Juncus effusus L. Common Rush.

619909—Meadow, seven miles on Madison road.

Juncus tenuis Willd. Slender Rush. Yard Rush.

619912—Meadow next wet woods, seven miles on Madison road.

Juncus marginatus Rostk. Grass-leaved Rush.

619910—Next the wet woods, seven miles on Madison road.

Juncus aristulatus Michx. Large Grass-leaved Rush.

Juncus marginatus aristulatus (Michx.) Coville.

Juncus Torreyi Coville. Torrey's Rush.

Juncus brachycarpus Engelm. Short-fruited Rush.

619910—Meadow next woods, seven miles on Madison road.

Juncus scirpoides Lam. Scirpus-like Rush. (Clark catalog, 1852).

Juncus acuminatus Michx. Sharp-fruited Rush.

619908—Field next the wet woods, seven miles on Madison road.

Juncoides campestris (L.) Kuntze. Common Wood-rush.

Luzula campestris (L.) DC.

619913—Banklick Hills. (Kenton Co., Ky.)

619914—High bank below Taylor's dam. (Campbell Co., Ky.)

619915—Hill woods next Este's bog.

Melanthaceae

Chamaelirium luteum (L.) A. Gray. Blazing-star.

‡*Melanthium virginicum* L. Bunch-flower.

619921.

Liliaceae

§*Hemerocallis fulva* L. Day Lily.

Allium tricoccum Ait. Wild Leek.

619917—Taylor's Newport woods. (Campbell Co., Ky.)

619918—Near Taylor's saw mill dam. (Campbell Co., Ky.)

Allium cernuum Roth. Nodding Wild Onion.

§*Allium vineale* L. Wild Garlic. Field Garlic.

Allium canadense L. Meadow Garlic.

619916.

Lilium canadense L. Canada Lily.

Lilium superbum L. Turk's-cap Lily. (Clark catalog, 1852; Aiken catalog, 1911)

Erythronium americanum Ker. Yellow Adder's-tongue.

619920.

Erythronium albidum Nutt. Trout Lily.

619919.

§*Quamasia hyacinthina* (Raf.) Britton. Wild Hyacinth.

Camassia esculenta (Ker.) Robinson.

619923.

§*Ornithogalum umbellatum* L. Star-of-Bethlehem.

Yucca filamentosa L. Adam's Needle.

Convallariaceae

§*Asparagus officinalis* L. Asparagus.

Vagnera racemosa (L.) Morong. Wild or False Spikenard.

Smilacina racemosa (L.) Desf.

619924—Woods.

Uvularia grandiflora J. E. Smith. Large-flowered Bellwort.

619940.

Uvularia sessilifolia L. Sessile-leaved Bellwort.

Oakesia sessilifolia (L.) Wats.

Polygonatum biflorum (Walt.) Ell. Hairy Solomon's Seal.

Polygonatum commutatum (R. & S.) Dietr. Smooth Solomon's Seal.

619922—Woods.

Trilliaceae

Medeola virginiana L. Indian Cucumber-root.

Trillium sessile L. Wake-robin.

619939—Stone's hill. An aberrant form: seven leaves, seven sepals, eight petals, sixteen stamens in two sets of eight surrounding each of the two 4-celled partly coalesced ovaries.

Trillium recurvatum Beck. Prairie Wake-robin. (James catalog, 1879).

Trillium declinatum (A. Gray) Gleason.

619936—Ravine in Williamson's old field toward's Banklick. (Kenton Co., Ky.)

On basis of relative length of anthers and stigmas, this specimen is referable to *T. erectum*, but these characters are of doubtful value.

619937—Shady woods.

619938—Woods.

Specimens of *Trillium* from the vicinity of Cincinnati referred to *T. declinatum* vary in color from all white through pink to all red; in some white flowered forms, the ovary is red or streaked with red.

Smilacaceae

Smilax herbacea L. Carrion-flower.

Specimen referred to this species by F. W. Pennell, with note—"approaching *S. lasioneuron* Hook."

Smilax lasioneuron Hook. (Det. by F. W. Pennell).

Smilax herbacea lasioneuron (Hook.) A. DC.

619929—Taylor's field, Banklick. (Kenton Co., Ky.)

619930—Hillside near canal, Clarkson's rivulet.

619931—Ravine thicket seven miles on Madison road. 619932—Stone's hill.

Smilax ecirrhata (Engelm.) S. Wats. Upright Smilax.

619926—Edge of Riddle's swamp toward Barnett's.

619927—Edge of Riddle's pond toward Barnett's.

619928—Riddle's, among bushes. "This is no doubt the pistillate plant, of which the staminate spms. were got along the edge of Riddle's pond." (numbers 619926-7) These specimens referred to *S. ecirrhata* by F. W. Pennell.

They are of particular interest because of the unusually large size of the plants—8 to 10 feet. See note on No. 619926.

Lea was apparently in doubt as to the specific identity of his specimens (Nos. 619926-619932); several are accompanied by detailed notes in which are mentioned some characters not apparent from the specimens. *S. ecirrhata* was not described until 1850, twelve years after these specimens were collected.

Lea writes of No. 619926: "*Smilax herbacea*?" "Stem (herbaceous) is in ridges, rather than angled. Peduncles, flattened, 2-edged, as long or longer than the petioles which are grooved and with two prominent ridges on their upper part, rounded beneath. In a younger state (spms. May 27th) the petioles were conspicuously 5-angled. Leaves pubescent and glaucous beneath. The leaves increase much in size, as well as the stem after flowering, attaining a height of 8-10 feet and lying over the tops of bushes or arching."

Of No. 619927, he writes: "*Smilax herbacea*" "Stems 4-6 feet. Agrees well with Ell. des. which is exact except the stem is arching at summit. The petioles are rarely margined at base and are without tendrils. Seldom with axillary branches. Flowers are fetid. Sometimes there are one or two of the lowest peduncles without any leaves, having a lanceolate membranaceous bract about one inch long—then peduncles are longer than the axillary ones above."

No. 619930, which we have referred to *S. lasioneuron*, Lea compared with specimens he had marked *S. herbacea* (i.e., Nos. 619926-619928), and concluded: "I think this is a distinct species . . . and that it is the peduncularis. Darl. supposes it to be only a variety of *herbacea*. This is also in flower about three weeks later than the *herbacea* [i.e., *ecirrhata*] got at Riddle's."

Smilax glauca Walt. Glaucous-leaved Greenbrier.

619934—In Taylor's old field. (Kenton Co., Ky.)

Smilax hispida Muhl. Hispid Greenbrier.

619925—Ludlow's meadow. 619933—Top of Riddle's copse bank.

Smilax rotundifolia L. Greenbrier. (Clark catalog, 1852; James catalog, 1879; Aiken catalog, 1911).

Smilax Pseudo-China L. Long-stalked Greenbrier.

619935—Bullock's hill.

Amaryllidaceae

Hypoxis hirsuta (L.) Coville. Yellow Star-grass.

619942—Banks and top of hills at Banklick (Kenton Co., Ky.)

Dioscoreaceae

Dioscorea villosa L. Wild Yam-root.

619941—On this page are three specimens, two of which have glabrous leaves, and may be referred to *D. villosa* var. *glabra* Lloyd.

Iridaceae

†*Iris versicolor* L. Larger Blue-flag. (Not seen since 1920).

619944—Ludlow's. 619945—Boggy springs, Ludlow's.

‡*Iris foliosa* Mackenzie & Bush. Leafy Blue-flag.

619943—Ludlow's far springy bog.

Species described in 1902. Lea realized that this specimen differed from his other two, and appended the note: "Germ with the angles deeply sulcate making it hexagonal with angles sub-alated. Leaves longer than the flexuous compressed stem: Inner segments of perianth longer than the stigmas."

§*Gemmingia chinensis* (L.) Kuntze. Blackberry Lily.

Belamcanda chinensis (L.) DC.

‡*Sisyrinchium albidum* Raf. White Blue-eyed Grass.

619947—Near canal, n.west. Also in Clarkson's woods.

Sisyrinchium angustifolium Mill. Pointed Blue-eyed Grass.

Sisyrinchium graminoides Bicknell. Stout Blue-eyed Grass.

Sisyrinchium gramineum Curtis.

619946—Meadow bank over Mill creek.

Orchidaceae

‡*Cypripedium reginae* Walt. Showy Ladies' Slipper.

Cypripedium hirsutum Mill.

Cypripedium spectabile Salisb.

619960—Ludlow's bog. (This station is nearly 100 miles south of any other Ohio record.)

†*Cypripedium parviflorum* var. *pubescens* (Willd.) Knight. Larger Yellow Ladies' Slipper.

619959—Hills over Banklick. (Kenton Co., Ky.)

Galeorchis spectabilis (L.) Rydb. Showy Orchis.

Orchis spectabilis L.

619964—Hillside east of Newport; plenty. (Campbell Co., Ky.)

619965—Ravine near Banklick. (Kenton Co., Ky.)

Blephariglottis peramoena (A. Gray) Rydb. Fringeless Purple Orchis.

Habenaria peramoena Gray.

619962—Taylor's meadow. (Banklick, Kenton Co., Ky.)

Triphora trianthophora (Sw.) Rydb. Nodding Pogonia.

Pogonia trianthophora (Sw.) B. S. P.

619970—Woods beyond Lane Seminary.

619971—Banklick flat. (Kenton Co., Ky.)

Ibidium cernuum (L.) House. Nodding Ladies'-tresses (Det. by E. T. Wherry).

Cyrostachys cernua (L.) Kuntze.

Spiranthes cernua (L.) Richard.

619967—Meadow. . . 4 miles on Sharpsburg road.

Ibidium ovale (Lindl.) House. Small-flowered Ladies'-tresses. (Det. by E. T. Wherry).

Spiranthes ovalis Lindl.

619966—Clarkson's. 619968—Damp woods, 1½ miles north.

619969—Flat open dry woods next to Ludlow's fields, north.

Ibidium gracile (Bigel.) House. Slender Ladies'-tresses. (Det. by E. T. Wherry).

Cyrostachys gracilis (Bigel.) Kuntze.

Spiranthes gracilis (Bigel.) Beck.

Peramium pubescens (Willd.) MacM. Downy Rattlesnake Plantain.

Epipactis pubescens (Willd.) A. A. Eaton.

619961—Taylor's dam. (Campbell Co., Ky.)

Liparis liliifolia (L.) Richards. Large Twayblade.

Leptorchis liliifolia (L.) Kuntze.

619963—Taylor's dam. (Campbell Co., Ky.)

Aplectrum hyemale (Muhl.) Torr. Adam-and-Eve. Putty-root.

Aplectrum spicatum (Walt.) B. S. P.

619948—Ludlow's. 619949—Dry hills, four miles north.

‡*Corallorrhiza maculata* Raf. Large Coral-root.

Corallorrhiza multiflora Nutt.

619950—Correy's woods; also from woods towards Armstrong's old dam.

619951—Woods towards Armstrong's. 619952.

Corallorrhiza Wisteriana Conrad. Wister's Coral-root.

619955. 619956—Burnet's woods, shady rich hills.

619957—Slope of hill, lower end of Este's bog.

619958—Hills over Banklick. (Kenton Co., Ky.)

Corallorrhiza odontorhiza (Willd.) Nutt. Small or Late Coral-root.

619953—Woods, Banklick flat. (Kenton Co., Ky.)

619954—Woods, two miles north.

Saururaceae

Saururus cernuus L. Lizard's-tail.

619972—Banklick. (Kenton Co., Ky.)

Juglandaceae

Juglans nigra L. Black Walnut.

619983—Riddle's field.

Juglans cinerea L. Butternut. White Walnut.

Hicoria Pecan (Marsh) Britton. Pecan.

Carya illinoensis (Wang.) K. Koch.

Hicoria cordiformis (Wang.) Britton. Bitter-nut.

Hicoria minima (Marsh) Britton.

Carya cordiformis (Wang.) K. Koch.

619976—Riddle's, near the canal. 619977—Hillside below Stone's house.

Hicoria ovata (Mill.) Britton. Shag-bark. Shell-bark Hickory.

Carya ovata (Mill.) K. Koch.

619980—Back of Newport, Ky.

Hicoria laciniosa (Michx.f.) Sarg. Big Shag-bark. King-nut.

Carya laciniosa (Michx.f.) Loud.

619981—Riddle's, upper pond.

Hicoria alba (L.) Britton. White-heart Hickory. Mocker-nut.

Carya alba (L.) K. Koch.

619982—End of hill, canal bridge basin.

Hicoria microcarpa (Nutt.) Britton. Small-fruited Hickory.

Carya microcarpa Nutt.

Hicoria glabra (Mill.) Britton. Pig-nut Hickory.

Carya glabra (Mill.) Spach.

619978—Clarkson's woods. 619979—Clarkson's woods.

Hicoria villosa (Sarg.) Ashe.

Carya glabra var. *villosa* (Sarg.) Robinson.

Salicaceae

§*Populus alba* L. White or Silver-leaf Poplar.

§*Populus canescens* Smith. Gray Poplar.

Populus grandidentata Michx. Large-toothed Aspen.

619973—Edge of ravine three mi. north beyond Longworth's vineyard.

619974—(pistillate aments) Same locality.

Populus tremuloides Michx. Aspen.

§*Populus italica* Moench. Lombardy Poplar.

Populus dilatata Ait.

Populus nigra var. *italica* Du Roi.

Populus deltoides Marsh. Cottonwood.

(According to the interpretation of the law of priority as followed at the Arnold Arboretum, the name *Populus balsamifera* L. would be used for the common cottonwood, and the name *Populus tacamahacca* used for the balsam poplar.) 619975—Shore of the Little Miami.

Salix nigra Marsh. Black Willow.

Salix amygdaloides Anders. Peach-leaved Willow.

§*Salix fragilis* L. Crack Willow. Brittle or Snap Willow. (James Catalog, 1879).

Salix interior Rowlee. Sandbar Willow. River-bank Willow.

Salix fluviatilis Nutt.

Salix longifolia Muhl.

§*Salix alba* L. White Willow.

incl. var. *vitellina* (L.) Koch, Golden Osier.

§*Salix babylonica* L. Weeping Willow.

Salix cordata Muhl.

§*Salix purpurea* L. Purple Willow.

Salix sericea Marsh. Silky Willow.

Salix discolor Muhl. Pussy, Glauous or Silver Willow.

§*Salix caprea* L. Goat Willow.

Betulaceae

Carpinus caroliniana Walt. American Hornbeam. Black Beech. Ironwood.

619984—Bullock's ravine.

Ostrya virginiana (Mill.) Willd. Hop-hornbeam. Ironwood.

619988—Below Mrs. Lee's

Corylus americana Walt. Hazel-nut.

619985.

Alnus rugosa (DuRoi) Spreng. Smooth Alder.

Fagaceae

Fagus grandifolia Ehrh.

(Includes the variety *caroliniana* Fernald & Rehder.)

619986—Taylor's Newport woods. 619987.

Castanea dentata (Marsh.) Borkh. Chestnut.

Quercus rubra L. Red Oak.

Quercus borealis var. *maxima* Ashe.

620003—Banklick. (Kenton Co., Ky.)

Quercus palustris DuRoi. Pin Oak.

620002—Banklick dam. (Kenton Co., Ky.)

Quercus Schneckii Britton. Schneck's Oak.

Quercus coccinea Wang. Scarlet Oak.

619994—Banklick flat. (Kenton Co., Ky.)

Quercus velutina Lam. Black Oak. Quercitron.

619993—Clarkson's, open hill.

620004—Edge of Banklick woods. (Kenton Co., Ky.)

620005—Banklick flat woods. "From top limbs of a tree about 40 ft. high."

620006—Clarkson's. "These leaves are from the lowest branches."

620007—Clarkson's. "These leaves were got from near the top of the tree; the leaves differ from those got on the lowest branches."

Quercus imbricata Michx. Shingle Oak.

619995—Banklick. (Kenton Co., Ky.)

Quercus Leana Nutt.

619996—Cassilly's. 619997—Roadside NW of Cassilly's.

619998—Clarkson's. "A young tree on the top of the hill (Clarkson's) near the side of the new road, now making. I think it is on the left hand side going down. The inner bark is very bitter and astringent. There is no fruit on it." (This is the tree from which the type specimen was taken. The road mentioned on Lea's label is now Glenmary Ave. in Clifton, Cincinnati. The tree, now quite large, is still alive.)

619999—"These spms. were got by J. Clark from a tree on Mrs. Cornish's farm on the West Fork of Mill creek about 12 miles from Cincinnati. It is in the woods where there are but few oaks, a middle sized tree, about as large as the one on Dr. Marshall's farm.

"Mr. Clark some time ago found a tree of the same species in Kentucky about seven miles from Cincinnati on the roadside from Newport to Alexandria. He brought spms. of it home and compared them with my authentic ones, and is certain of their accordance.

"This species will probably be found more diffused than I supposed." August 1, 1843.

(With specimen No. 619999, is a copy of Nuttall's description and notes in which he quotes from the notes of Thomas G. Lea; from Silliman's Jour.: No. 89, p. 94.) See North American Sylva, Vol. 4, Nuttall, Vol. 1, pp. 25-27.

Quercus Leana is not at all general around Cincinnati, but occasional individuals are found.

Quercus alba L. White Oak.

620008.

Quercus stellata Wang. Post Oak. (Fide J. E. Palmer, Arnold Arboreum).

Quercus minor (Marsh.) Sarg.

620001—Clarkson's.

Lea writes: "These specimens are from a small tree in Clarkson's woods over the fence and near the gate going out of the open woods where the *Gerardia* grows. It grows close to another and larger oak. The leaves are so like my spms. of *obtusiloba* collected in Jersey that it would be difficult to distinguish them. If it should be that species it is the first observed here. But it may be only *Q. macrocarpa*. It should be watched for the fruit to determine it. August 23, 1843."

The leaves are remarkably like those of *Q. stellata* (*Q. obtusiloba*); they are finely stellate pubescent beneath. The buds are brownish-gray tomentose, with a few short stipules in the terminal cluster. The leaves are much less rough above than in *stellata*. If this specimen be referred to *Q. stellata* instead of *Q. macrocarpa*, it is the only record of that species in southwestern Ohio.

Quercus macrocarpa Michx. Mossy-cup Oak. Bur Oak.

620000—Cincinnati.

Quercus macrocarpa var. *olivaeformis* (Michx.f.) Gray.

Quercus bicolor Willd. Swamp White Oak.

Quercus platanoides (Lam.) Sudw.

619989—Banklick flat. (Kenton Co., Ky.)

619990—About six miles on the Madison road . . . low swampy woods. Plenty.

Quercus Muhlenbergii Engelm. Chestnut or Yellow Oak.

Quercus acuminata (Michx.) Sarg.

619991—Burnet's. 619992—Road to Ludlow's (spm. from top of tree).

Quercus prinoides Willd. Scrub or Dwarf Chestnut Oak.

Ulmaceae

Ulmus americana L. American, White or Water Elm.

620012—Spm. from "top of a prostrate tree"; consists of mature leaves and full-grown green samaras.

Ulmus Thomasi Sarg. Cork or Rock Elm.

Ulmus racemosa Thomas.

Ulmus fulva Michx. Slippery Elm. Red Elm.

620013—Flowers: hill $\frac{1}{2}$ mile east of reservoir. Samaras: Riddle's gravelly bank. Leaves: Dickinson's hill.

Celtis occidentalis L. Hackberry. Sugar-berry.

620009—Hill near Dickinson's. 620010—Stone's hill. 620011.

Celtis crassifolia Lam. Rough-leaved Hackberry.

("Probably not specifically distinct from the preceding.")

Moraceae

Morus rubra L. Red Mulberry.

620014—Woods. (The leaves of this specimen are not scabrous above.)

Toxylon pomiferum Raf. Osage Orange.

Maclura pomifera (Raf.) Schneider.

§*Papyrius papyrifera* (L.) Kuntze. Paper Mulberry.

Broussonetia papyrifera (L.) Vent.

Cannabinaceae

Humulus Lupulus L. Hop.

§*Cannabis sativa* L. Hemp.

Urticaceae

§*Urtica dioica* L. Stinging Nettle. Great Nettle. (James catalog, 1879; Aiken catalogs, 1904, 1911.)

Urtica gracilis Ait. Slender or Tall Wild Nettle.

620022—River shore below Corbin's. 620023—Riddle's field.

Urticastrum divaricatum (L.) Kuntze. Wood Nettle.

Laportea canadensis (L.) Gaud.

620020—(Specimen has leaf unusually large: $9\frac{1}{2}$ inches long, 6 inches wide, on petiole $5\frac{1}{2}$ inches long.) 620021—(fertile plant).

Pilea pumila (L.) A. Gray. Richweed. Clearweed.

Adicea pumila (L.) Raf.

620019.

Boehmeria cylindrica (L.) Sw. False Nettle.

620017—Dry hills.

Boehmeria cylindrica var. *scabra* Porter.

620016. 620015—In Este's bog.

Specimens 620015, 620016, 620017 form a series, the extremes of which are strikingly different.

620015—The petioles are 4-7 mm. long, stout, densely hoary pubescent; the leaves very scabrous and all reflexed; spikes dense and little interrupted, erect, scarcely leafy at summit.

620016—The petioles are 6-12 mm. long, more slender, pubescent but not densely so and scarcely hoary; leaves thinner, less scabrous, horizontal or reflexed; spikes less dense, ascending, leafy at summit.

620017—The petioles are 14-40 mm. long, slender, pubescent along upper side; leaves thin, scabrous, but less so than No. 620016, horizontal or ascending; spikes slender and much interrupted, only one with a small leaf at the summit.

Parietaria pennsylvanica Muhl. Pellitory.

620018—Woods.

Loranthaceae

Phoradendron flavescens (Pursh) Nutt. Mistletoe.

620024—From a *Gleditsia* on river bank below Pleasant Run, Ky.: shore. Oct. 27, 1838.

620025—(From same tree as No. 620024.) Oct. 22, 1838.

The time of flower maturity is considered in Lea's notes:

"Many flowers were examined on these two specimens got Oct. 22nd from a *Gleditsia triac.*—(and as they are now in flower may this not be considered the proper date?) They are all staminate." . . .

On note of Oct. 27/38: "I do not know how to reconcile the *flowering stalk* of the barren plants got the 22d int. with the *perfected* state of the fruit in these spms."

"Sept. 20, 1839—Spms. from the elm tree . . . examd. today—a few of the staminate flowers are just opening, but most of them are yet closed . . . A spm. from the tree at . . . Stone's hill had some berries on; they are about $\frac{3}{4}$ ths the full size—on the same branch were several barren spikelets exactly agreeing with the spms. collected Oct. 27/38."

A later note: "The male flower of the Mistletoe begins to be visible for nearly a year before its expansion. The anther is then not distinguishable from the green calyx by which it is embraced etc.—See *Annals Nat. Hist.* Vol. 7, p. 185."

Santalaceae

Comandra umbellata (L.) Nutt. Bastard Toad-flax.

Comandra umbellata and *Comandra Richardsiana* Fernald, as defined in Gray's Manual.

Aristolochiaceae

Asarum canadense L. Wild Ginger.

620027—Woods.

Asarum acuminatum (Ashe) Bicknell. Long-tipped Wild Ginger.

Asarum canadense var. *acuminatum* Ashe.

620027—Woods.

The sheet No. 620027 contains four plants, one of which has the caudate-acuminate calyx segments and long pubescent petioles of *A. acuminatum*. *A. canadense* and *A. acuminatum* do not usually occur in the same sort of soil; the latter is more generally confined to glacial deposits. Though the four plants are grouped as coming from the same place, it is entirely possible, in several of the areas frequented by Lea, to have found the unlike conditions under which these two forms occur and within short distances of one another.

Asarum reflexum Bicknell.

Asarum canadense var. *reflexum* (Bicknell) Robinson.

Aristolochia Serpentaria L. Virginia Snakeroot.

620026—Hills, three miles north.

Polygonaceae

§*Rumex Acetosella* L. Field or Sheep Sorrel.

620040. 620041—Fields.

Rumex altissimus Wood. Peach-leaved Dock.

620047—Riddle's wet meadow. (In addition to a description, the specimen bears the note: "I think undescribed." The species was not described until 1853)

‡*Rumex Britannica* L. Great Water-Dock.

620043—Wet, Ludlow's. 620045—Este's prairie bog. 620046—Este's bog.

- §*Rumex crispus* L. Curled or Narrow Dock.
 620042.
- §*Rumex obtusifolius* L. Broad-leaved or Bitter Dock.
 620044.
- Polygonum aviculare* L. Knot-grass. Knotweed.
 620030.
- Polygonum erectum* L. Erect Knotweed.
 620032.
- Tovara virginiana* (L.) Raf. Virginia Knotweed.
Polygonum virginianum L.
 620039—Banklick.
- Persicaria amphibia* (L.) S. F. Gray. Water Persicaria. Willow-weed.
Polygonum amphibium L.
- Persicaria Muhlenbergii* (S. Wats.) Small. Swamp Persicaria.
Polygonum Muhlenbergii (Meisn.) Wats.
Polygonum emersum Britton.
 620028—Ludlow's bog prairie.
- Persicaria lapathifolia* (L.) S. F. Gray. Dock-leaved or Pale Persicaria.
Polygonum lapathifolium L.
Polygonum incarnatum Ell.
 620032—Old mill dam in rivulet ravine toward Armstrong's.
- Persicaria pennsylvanica* (L.) Small.
Polygonum pennsylvanicum L.
 620035—Corn field above Cumminsville at Garrard's.
- §*Persicaria Persicaria* (L.) Small. Lady's Thumb. Heartweed.
Polygonum Persicaria L.
- Persicaria hydropiperoides* (Michx.) Small. Mild Water Pepper.
Polygonum hydropiperoides Michx.
 620034—Riddle's, corn field pond.
- Persicaria Hydropiper* (L.) Opiz. Smart-weed. Water Pepper.
Polygonum Hydropiper L.
- Persicaria punctata* (Ell.) Small. Dotted or Water Smart-weed.
Polygonum punctatum Ell.
Polygonum acre H. B. K.
 620029—Wet. 620036—Rivulet near Wallace's back of Covington.
- §*Persicaria orientalis* (L.) Spach.
Polygonum orientale L.
- §*Fagopyrum Fagopyrum* (L.) Karst. Buckwheat.
Fagopyrum esculentum Moench.
- Tracaulon sagittatum* (L.) Small. Arrow-leaved Tear-thumb.
Polygonum sagittatum L.
 620037—Wet.
- Tracaulon arifolium* (L.) Raf. Halberd-leaved Tear-thumb.
Polygonum arifolium L.
 620029—Wet.
- §*Tiniaria Convolvulus* (L.) Webb. & Moq. Black or Corn Bindweed.
Polygonum Convolvulus L.
 620031—Field near Burnet's woods.
- Tiniaria scandens* (L.) Small. Climbing False Buckwheat.
Polygonum scandens L.
 620038—Edge of woods in Garrard's corn field.
- Tiniaria cristata* (Engelm. & Gray) Small. Crested False Buckwheat.
Polygonum cristatum Engelm. & Gray.

§*Pleuropterus Zuccarinii* Small. Japanese Knotweed.

Polygonum Zuccarinii Small.

Polygonum cuspidatum Sieb. & Zucc.

Amaranthaceae

§*Amaranthus retroflexus* L. Green Amaranth. Pigweed.

620054—620055.

§*Amaranthus hybridus* L. Spleen Amaranth. Pilewort. Pigweed.

§*Amaranthus spinosus* L. Spiny or Thorny Amaranth.

620056—Cincinnati.

Amaranthus graecizans L. Tumble-weed.

Acnida tuberculata Moq. Rough-fruited Water-hemp.

Acnida tamariscina var. *tuberculata* (Moq.) Uline & Bray.

620052—Ludlow's 620053.

Ivesine paniculata (L.) Kuntze. Blood-leaf.

620057—Licking shore above Banklick. (Kenton Co., Ky.)

Chenopodiaceae

§*Chenopodium album* L. Lamb's Quarters. Pigweed. Goosefoot.

620048—Ludlow's.

§*Chenopodium glaucum* L. Oak-leaved Goosefoot. (Lloyd catalog, 1891).

Chenopodium leptophyllum (Moq.) Nutt. Narrow-leaved Goosefoot.

Chenopodium Boscianum Moq. (Lloyd, 1891.)

§*Chenopodium urbicum* L. Upright or City Goosefoot. (Clark catalog, 1857; Lloyd catalog, 1891.)

§*Chenopodium murale* L. Nettle-leaved Goosefoot.

§*Chenopodium Botrys* L. Feather Geranium. Jerusalem Oak.

620051.

§*Chenopodium ambrosioides* L. Mexican Tea.

620049—River shore.

§*Chenopodium ambrosioides* var. *anthelminticum* (L.) Gray.

620050—River shore.

Cycloloma atriplicifolium (Spreng.) Coult. Winged Pigweed.

Atriplex hastata L. Halberd-leaved Orache.

(Includes *A. patula* L.)

Salsola pestifer A. Nelson. Russian Thistle.

Salsola Kali var. *tenuifolia* G. F. W. Mey.

Phytolaccaceae

Phytolacca americana L. Poke. Scoke. Pokeweed.

Phytolacca decandra L.

620058—Cummins ville.

Corrigiolaceae

(Ilcebraceae)

Anychia polygonioides Raf. Forked Chickweed.

610062—Sandy bank below Saw Mill dam, Newport, Ky.

Anychia canadensis (L.) B.S.P. Slender Forked Chickweed.

620065.

Nyctaginaceae

Allionia nyctaginea Michx. Heart-leaved Umbrella-wort.

Oxybaphus nyctagineus (Michx.) Sweet.

Aizoaceae

- §*Mollugo verticillata* L. Carpet-weed.
620059.

Portulacaceae

- Claytonia virginica* L. Spring Beauty.
620060—(Broad-leaved specimen.) Stone's hill.
620061—(Narrow-leaved specimen.)
§*Portulaca oleracea* L. Purslane. Pussley.

Alsiniaceae

- §*Alsine media* L. Common Chickweed.
Stellaria media (L.) Cyrill.
Alsine pubera (Michx.) Britton. Great Chickweed.
Stellaria pubera Michx.
620071.
Alsine tennesseensis (C. Mohr) Small. Tennessee Chickweed.
Alsine longifolia (Muhl.) Britton. Long-leaved Stitchwort.
Stellaria longifolia Muhl.
620070—Taylor's meadow about rotten stumps.
§*Alsine graminea* (L.) Britton. Lesser Stitchwort.
Stellaria graminea L.
§*Cerastium viscosum* L. Mouse-ear Chickweed.
§*Cerastium vulgatum* L. Larger Mouse-ear Chickweed.
620064—Hills, fields, woods, etc.
Cerastium longipedunculatum Muhl. Nodding Chickweed. Powder-horn.
Cerastium nutans Raf.
620063.
Cerastium arvense L. Field or Meadow Chickweed. (Clark catalog, 1857;
James catalog, 1879.)
§*Holosteum umbellatum* L. Jagged Chickweed.
§*Arenaria serpyllifolia* L. Thyme-leaved Sandwort.

Caryophyllaceae

- §*Agrostemma Githago* L. Corn Cockle. Corn Campion.
Silene stellata (L.) Ait. Starry Campion.
620068—Woods.
Silene alba Muhl. Western White or Snowy Campion.
Silene nivea (Nutt.) Oth.
620067—Riddle's meadow.
§*Silene latifolia* (Mill.) Britten & Rendle. Bladder Campion.
Silene vulgaris (Moench.) Garcke.
§*Silene nutans* L. Nodding Catchfly.
Silene virginica L. Fire Pink.
620069—Thicket, Burnet's woods.
†*Silene regia* Sims. Royal Catchfly. (Clark catalog, 1857.)
†*Silene caroliniana* Walt. Wild Pink. (Clark catalog, 1857.)
Silene pennsylvanica Michx.
Silene antirrhina L. Sleepy Catchfly.
620066—Ludlow's, dry bank.
§*Silene noctiflora* L. Night-flowering Catchfly.
§*Lychnis alba* Mill. White Campion.

§*Saponaria officinalis* L. Soapwort. Bouncing Bet.

§*Vaccaria Vaccaria* (L.) Britton. Cow-herb.

Saponaria Vaccaria L.

§*Dianthus Armeria* L. Deptford Pink.

Ceratophyllaceae

Ceratophyllum demersum L. Hornwort. Hornweed.

620075—Little Miami pond. 620076—Mill creek pond.

Nelumbonaceae

Nelumbo lutea (Willd.) Pers. American Lotus.

620072—Pond at Columbia.

Nymphaeaceae

†*Nymphaea advena* Soland. Cow-lily. Spatter-dock.

620073—Mill creek pond. 620074.

Magnoliaceae

Liriodendron tulipifera L. Tulip-tree.

620128.

Annonaceae

Asimina triloba (L.) Dunal. Papaw.

620129. 620130—Above Newport.

Ranunculaceae

Hydrastis canadensis L. Orange-root. Golden Seal.

620090—Clarkson's woods. 620091—Woods.

Caltha palustris L. Marsh Marigold.

620082—Ludlow's, bogs. 620081—Ludlow's.

Isopyrum biternatum (Raf.) T. & G. False Rue Anemone.

620086—Woods back of Mrs. L(ee's). 620087—Rich hillside, open woods.

†*Actaea rubra* (Ait.) Willd. Red Baneberry. (Clark catalog, 1857.)

Actaea alba (L.) Mill. White Baneberry.

620077—Woods.

Cimicifuga racemosa (L.) Nutt. Black Snakeroot.

620092—Borders of woods. Burnet's.

Lea's observations on the flowers of this plant are more accurate than given in some of the manuals. Following is his description:

"Calyx 4 caducous sepals—there are four deformed petals or rather *incompletely formed stamens*, the lamina is fleshy or thick, terminating in two divaricate processes, the stipes or filaments are shorter than those of the stamens. They rise from the same plane with the lower whorl of stamens and not outside of or below them as they should do if proper petals."

Aquilegia canadensis L. Wild. Columbine.

620080—(Lea's specimen is the large form found in deep soil; it differs both in color and habit from the plants growing on conglomerate rocks.)

§*Delphinium Ajacis* L. Rocket Larkspur.

Delphinium tricornis Michx. Dwarf Larkspur.

620085—Woods.

Anemone virginiana L. Tall Anemone.

620079—Woods.

†*Hepatica Hepatica* (L.) Karst. Round-lobed Liver-leaf.

Hepatica triloba Chaix.

Hepatica acutiloba DC. Sharp-lobed Liver-leaf.

620088—Taylor's dam. (Kenton Co., Ky.) 620089.

Syndesmon thalictroides (L.) Hoffing. Rue Anemone.*Anemonella thalictroides* (L.) Spach.

620078—Woods. 620114—Stone's Hill.

‡*Trautvetteria carolinensis* (Walt.) Vail. False Bugbane.

620121—Taylor's wet meadow, Banklick. (Kenton Co., Ky.)

A plant of southern range, not known in Ohio; seems to be one of those passive species which has not extended its range north of the glacial boundary. Lea's notes give height of plant as 3-4 feet, whereas both Britton and Brown and Gray give 2-3 feet, indicating that although the plant was growing at the extreme northern limit of its range, it was in a very favorable habitat.

Ranunculus pusillus Poir. Low Spearwort.*Ranunculus abortivus* L. Smooth-leaved Crowfoot.

620093—Riddle's. 620095—Base of hill below Stone's rivulet. 620097.

620113—Stone's hillside.

Ranunculus micranthus Nutt.

620094—Riddle's meadow. (A note with this specimen points out a difference between the nectaries of *R. abortivus* and *R. micranthus*: "The nectary of these specimens i.e., hairy ones—*micranthus* is either truncate, rounded or a little pointed at summit—some specimens of *R. abortivus* (glabrous) have the summit of the pouch-like nectary bifid or retuse.")

620096—Stone's hill. 620098.

620101—"This specimen has been seen by Mr. Nuttall and pronounced by him *R. micranthus*."

The similarity of this species (not described until 1838) and *R. abortivus* caused Lea to make a number of comparative notes regarding the two species.

"This has much the look of *R. abortivus* but it is always more or less hairy, the radicle leaves often three parted and the root usually a fascicle of tubers." Of *R. abortivus* (No. 620095) he says: "Stem and leaves glabrous—the latter with the carpels shining."

620102—Stone's hill.

Though the specimens of *R. micranthus* are, with the exception of Nos. 620101 and 620102, named *R. abortivus*, Lea was evidently not satisfied to apply this name to all, as his critical notes indicate. He had distinguished the two species, but it was not until 1838 that *R. micranthus* was described by Nuttall.

Ranunculus sceleratus L. Celery-leaved Crowfoot.*Ranunculus recurvatus* Poir. Hooked or Rough Crowfoot.

620103—Woods back of Riddle's. 620104.

§*Ranunculus acris* L. Tall or Meadow Buttercup.*Ranunculus repens* L. Creeping Buttercup.*Ranunculus septentrionalis* Poir. Swamp or Marsh Buttercup.

620100—Near pond, Riddle's.

620107—Este's bog. "It is the largest species we have."

This specimen and No. 620108 are larger and stouter than is usual for the species around Cincinnati. However it now occurs in but few places, which perhaps are not the most favorable for its development.

620108—Este's bog. 620109—Wet meadow west of Mill creek.

620110—Riddle's meadow. "Most of the stems prostrate, long, flower-bearing as well as the erect ones."

This character, noted by Lea, and the achenes distinguish the species from *R. hispidus* which it most resembles. In *R. hispidus* the inflorescence is definitely determinate; in *R. septentrionalis*, it appears to be indeterminate, because of the axillary branches which continue to elongate the stem. No. 620100, collected in April, lacks the stoloniferous stems which are later so distinctive.

Ranunculus hispidus Michx. Hispid Buttercup.

620105—Road next to Clarkson's, back of Bryans.

620106—Hillside along ravine north of Dickinson's hill. 620111—Stone's hill.

620112—Taylor's wet meadow.

Ranunculus fascicularis Muhl. Early or Tufted Buttercup.*Batrachium trichophyllum* (Chaix) F. Schultz. White Water-crowfoot.*Ranunculus aquatilis* L. var. *capillaceus* DC.*Batrachium circinatum* (Sibth.) Rehb. Stiff White Water-crowfoot.*Ranunculus circinatus* Sibth.

620099—Howell's basin.

Thalictrum dasycarpum Fisch. & Lall. Tall Meadow-rue.*Thalictrum purpurascens* L. in B. & B., ed. 1.*Thalictrum dioicum* L. Early Meadow-rue.

620117—Dry denuded hillside one mile east of reservoir. (pistillate).

620118—Hilly woods back of Stone's. (staminate)

620119—(staminate, young). 620120—Woods. (pistillate).

Thalictrum polygamum Muhl. Fall Meadow-rue.

620115—West slope of hill, Clarkson's woods. 620116—Edge of Riddle's pond.

Clematis virginiana L. Virgin's Bower.

620084—Dayton.

Viorna Viorna (L.) Small. Leather-flower.*Clematis Viorna* L.

620083.

Berberidaceae§*Berberis vulgaris* L. European Barberry.*Caulophyllum thalictroides* (L.) Michx. Blue Cohosh.

620122—Woods.

Jeffersonia diphylla (L.) Pers. Twin-leaf.

620123—Woods, hill back of Stone's.

620124—One specimen "has a minute, bifoliate, petioled leaf on the scape near the middle."

620125—Specimens in fruit; one with lobed leaves.

Podophyllum peltatum L. May Apple. Wild Mandrake.

620126.

*Menispermaceae**Menispermum canadense* L. Canada Moonseed.

620127—Woods.

*Lauraceae**Sassafras Sassafras* (L.) Karst. Sassafras.*Sassafras variifolium* (Salisb.) Ktze.

620132. 620133—Banklick.

Benzoin aestivale (L.) Nees. Spice-bush or Spice-wood.*Benzoin Benzoin* (L.) Coulter.

620131—Riddle's, gravelly bank.

*Papaveraceae**Sanguinaria canadensis* L. Bloodroot.

620140.

Stylophorum diphyllum (Michx.) Nutt. Celandine Poppy.§*Chelidonium majus* L. Celandine.

Fumariaceae

Bicuculla Cucullaria (L.) Millsp. Dutchman's Breeches.

Dicentra Cucullaria (L.) Bernh.

620137—Riddle's. 620138.

Bicuculla canadensis (Goldie) Millsp. Squirrel Corn.

Dicentra canadensis (Goldie) Walp.

620135—Above Newport. (Kenton Co., Ky.) 620136—Side of Riddle's orchard, near the copse bank. 620139—Woods up Taylor's dam. (Kenton Co., Ky.)

Capnoides flavulum (Raf.) Kuntze. Pale or Yellow Corydalis.

Corydalis flavula (Raf.) DC.

620134—Riddle's, Copse bank. This is the plant recorded in Lea's catalog as *C. aurea*.

Cruciferae

§*Draba verna* L. Vernal Whitlow-grass.

620161—Grass field, Loring's, near Mill creek. 620162.

No. 620161, consisting of 13 plants, is rather uniform in character; No. 620162, of 10 plants, includes three of a distinctly larger flowered race.

§*Alyssum alyssoides* L. Yellow or Small Alyssum.

§*Camelina sativa* (L.) Crantz. Gold-of-Pleasure. False Flax.

620149—Field next to Newport race ground. (Kenton Co., Ky.)

§*Bursa Bursa-pastoris* (L.) Britton. Shepherd's-purse.

Capsella Bursa-pastoris (L.) Medic.

620168—Meadows.

§*Radicula sylvestris* (L.) Druce. Creeping Yellow Water-cress.

Roripa sylvestris (L.) Bess.

Radicula palustris (L.) Moench. Marsh or Yellow Water-cress.

Roripa palustris (L.) Bess.

620165—Common in inundated grounds; Taylor's cornfield, roadside to Banklick. (Kenton Co., Ky.)

620166—Gilmore's—Mill creek. This specimen has silicles shorter and more globose than No. 620165, of the form of *R. hispida*; the stem is glabrous. The plant is intermediate between *R. palustris* and *R. hispida*, favoring varietal rank of the latter.

Radicula sessiliflora (Nutt.) Greene. Sessile-flowered Cress.

Roripa sessiliflora (Nutt.) A. S. H.

§*Sisymbrium nasturtium-aquaticum* L. True Water-cress

Roripa nasturtium (L.) Rusby.

Radicula nasturtium-aquaticum (L.) B. & R.

§*Armoracia Armoracia* (L.) Britton. Horse-radish.

Roripa Armoracia (L.) A. S. H.

Radicula Armoracia (L.) Robinson.

‡*Neobeckia aquatica* (Eaton) Britton. Lake Water-cress. River-cress.

Roripa americana (A. Gray) Britton.

Radicula aquatica (Eat.) Robinson.

620164—In muddy borders and shallow water of pond, Banklick dam. (Kenton Co., Ky.)

The specimen shows none of the pinnately dissected leaves with capillary divisions found on more deeply immersed plants; the lowest leaves are pinnatifid, transitional in form between water and air leaves.

§*Lepidium campestre* (L.) R.Br. Field, Cow or Bastard Cress.

§*Lepidium Draba* L. Hoary Cress.

§*Lepidium ruderae* L. Roadside Pepper-grass. (Aiken catalog, 1904.)

- Lepidium virginicum* L. Wild Pepper-grass.
 §*Lepidium densiflorum* Schrad. Wild Pepper-grass.
Lepidium apetalum Willd.
 §*Thlaspi arvense* L. Field Penny-cress.
 §*Thlaspi perfoliatum* L. Perfoliate Penny-cress.
 §*Alliaria Alliaria* (L.) Britton. Hedge Garlic. Garlic Mustard.
Alliaria officinalis Andr.
Sophia pinnata (Walt.) Howell. Tansy-mustard.
Sisymbrium canescens Nutt.
Sisymbrium canescens var. *brachycorpon* (Richards) Wats.
Cheirinia inconspicua (S. Wats.) Britton. Small-flowered Prairie-rocket.
Erysimum inconspicuum (S. Wats.) MacM.
Erysimum parviflorum Nutt.
 §*Erysimum officinale* L. Hedge Weed or Mustard.
Sisymbrium officinale (L.) Scop.
 §*Norta altissima* (L.) Britton. Tumble Mustard.
Sisymbrium altissimum L.
 §*Conringia orientalis* (L.) Dumort. Hare's-ear. Treacle Mustard.
 §*Hesperis matronalis* L. Dame's Rocket or Dame's Violet.
 §*Arabisidopsis Thaliana* (L.) Britton. Mouse-ear or Thale-cress.
Stenophragma Thaliana (L.) Celak.
Sisymbrium Thalianum (L.) J. Gay.
Barbarea Barbarea (L.) MacM. Yellow Rocket. Yellow Cress.
Barbarea vulgaris R. Br.
 620147—Introduced; grassy bank front of our dwelling.
 620148—Grassy lot—front of the house.
 §*Barbarea verna* (Mill.) Aschers. Early Winter Belle Isle or Land Cress.
Barbarea praecox (J. E. Smith) R. Br.
Iodanthus pinnatifidus (Michx.) Steud. Purple or False Rocket.
 620156. 620163—Woods.
Arabis virginica (L.) Trelease. Virginia Rock-cress.
 620153—Stiff clayey earth in field back of Newport. Specimen accompanied by very detailed description. Listed in Lea's catalog as *A. ludoviciana*.
 620169—Mature siliques from plant ripened in garden.
Arabis dentata T. & G. Toothed Rock-cress.
 620142—Field at Burnet's woods. 620143—Burnet's field. 620144—Woods.
Arabis glabra (L.) Bernh. Tower Mustard.
Arabis laevigata (Muhl.) Poir. Smooth Rock-cress.
 620145—Banklick creek, flat woods.
Arabis canadensis L. Sickie-pod.
 620141—Woods.
Arabis Drummondii A Gray. Drummond's Rock-cress.
Arabis hirsuta (L.) Scop. Hairy Rock-cress. (Clark catalog, 1852; James catalog, 1879.)
Cardamine pennsylvanica Muhl. Bitter-cress.
 620150—Riddle's wet meadow and spring.
 620151—Riddle's. 620152—Riddle's meadow.
 Three specimens (Nos. 620150-1-2) are labeled *Cardamine hirsuta*, under which name this plant is recorded in the Lea catalog. Lea was apparently not satisfied with the determination. One specimen (No. 620150) was first labeled *Cardamine teres*, and changed to *C. hirsuta* in accordance with a letter from Darlington, Sept. 29; another (No. 620151) was *Cardamine* Sp. with *hirsuta*

added. It bears the note: "This may be *C. hirsuta*—but the leaves are decidedly pinnatifid, leaflets of the radical ones not orbicular or petiolate—I cannot find the seeds with one groove on each side!" Later a note was added (in pencil) "These are all probably the var. *virginica*."

Cardamine Douglassii (Torr.) Britton. Purple Cress.

Cardamine purpurea (Torr.) Britton.

620155—Woods hill back of Stone's.

This and *C. bulbosa* are recorded in Lea's catalog as *Cardamine rotundifolia*. On his labels, the former is distinguished as var. *a*; the latter as var. *β*. In this region, they differ markedly in habitat: *C. bulbosa* growing in wet meadows or thickets and springy banks; *C. Douglassii* in hillside woods, always in well-drained soil.

Cardamine bulbosa (Schreb.) B.S.P. Bulbous Cress.

620146—Wet meadows.

620154—Riddle's meadow and Taylor's meadow, Banklick.

Dentaria laciniata Muhl. Cut-leaved Toothwort.

620159—Woods. 620160—Woods back of Mrs. L.

Dentaria diphylla Michx. Two-leaved Toothwort.

620157—Bank of second rivulet above Newport. (Campbell Co., Ky.)

620158—Above Taylor's dam, Newport. (Campbell Co., Ky.)

Dentaria heterophylla Nutt. Slender toothwort.

Dentaria multifida Muhl.

§*Brassica nigra* (L.) Koch. Black mustard.

620167.

Capparidaceae

Cleome serrulata Pursh. Pink Cleome.

Polanisia graveolens Raf. Clammy-weed.

620170.

Crassulaceae

Sedum ternatum Michx. Wild Stonecrop.

620171.

Penthorum sedoides L. Ditch or Virginia Stonecrop.

620176.

Saxifragaceae

Micranthes virginicensis (Michx.) Small. Early Saxifrage.

Saxifraga virginicensis Michx.

620179—Dry woods.

Heuchera americana L. Alum-root.

620172.

Mitella diphylla L. Bishop's-cap. Mitre-wort.

620175—Little Miami hills ½ mile above the mouth.

Hydrangea arborescens L. Wild Hydrangea.

620173—Banklick meadows. (Kenton Co., Ky.)

620174—Edge of road on Banklick dam. (Kenton Co., Ky.) A specimen with leaves cuneate at the base.

Hamamelidaceae

Hamamelis virginiana L. Witch Hazel.

Altingiaceae

Liquidambar styraciflua L. Sweet Gum.

(Occurs only at the eastern outskirts of the region here included.)

Grossulariaceae

- §*Ribes nigrum* L. Black Currant.
 §*Ribes vulgare* Lam. Red Garden Currant.
Ribes americanum Mill. Wild Black Currant.
 Ribes floridum L'Her.
 620178—Road up hill below Stone's.
Grossularia Cynosbati (L.) Mill. Wild Gooseberry.
 Ribes Cynosbati L.
 620177—Ravine above Howell's basin. (flowers). Ludlow's meadows. (fruit).
Grossularia missouriensis (Nutt.) Cov. & Britt. Missouri Gooseberry.
 Ribes gracile Michx.
 §*Grossularia reclinata* (L.) Mill. Garden Gooseberry.
 Ribes Uva-crispa L.
 Ribes Grossularia L.

Platanaceae

- Platanus occidentalis* L. Sycamore. Buttonwood.
 620180—Riddle's pond. (Leaf 21¼ inches wide, from a young shoot.)

Rosaceae

- Opulaster opulifolius* (L.) Kuntze. Ninebark.
 Physocarpus opulifolius (L.) Maxim.
 620221.
Aruncus Aruncus (L.) Karst. Goat's-beard.
 Aruncus sylvestris Kostel.
 620218—Taylor's ravine, Campbell Co., Ky. 620219.
 †*Porteranthus stipulatus* (Muhl.) Britton. American Ipecac.
 Gillenia stipulata (Muhl.) Trel.
 620206—Brow of hill below Stone's.
 †*Filipendula rubra* (Hill) Robinson. Queen-of-the-Prairie.
 Ulmia rubra Hill.
 620220—Boggy border of the bank below Garrard's farm.
 §*Potentilla reptans* L.
Potentilla canadensis L. Five-finger. Cinquefoil.
 620208.
Potentilla monspeliensis L. Rough Cinquefoil.
Potentilla argentea L. Silvery or Hoary Cinquefoil.
 §*Potentilla recta* L. Rough-fruited Cinquefoil.
 §*Duchesnea indica* (Andr.) Focke. Mock or Indian Strawberry.
Fragaria virginiana Duchesne. Wild Strawberry.
 620204—Ludlow's, edge of meadow next to wet ground.
Fragaria vesca L. European Wood or Hedge Strawberry.
Drymocallis agrimonoides (Pursh) Rydb. Tall or Glandular Cinquefoil.
 Potentilla arguta Pursh. (Aiken catalog, 1904, 1911.)
 §*Poterium Sanguisorba* L. Salad Burnet.
 Sanguisorba Sanguisorba (L.) Britton.
 Sanguisorba minor Scop.
Agrimonia rostellata Wallr. Woodland Agrimony.
 Given as *Agrimonia striata* in B. and B., 1 Ed.
Agrimonia mollis (T. & G.) Britton. Soft Agrimony.
 620181—Open woods.

Agrimonia parviflora Soland. Many-flowered Agrimony.

620182—Bank of Fern ravine back of Newport. (Campbell Co., Ky.)

Geum virginianum L. Rough Avens.

Geum canadense Jacq. White Avens.

Geum flavum (Porter) Bicknell. Cream-colored Avens.

Geum strictum Ait. Yellow Avens.

Geum vernum (Raf.) T. & G. Spring Avens.

620205.

RUBUS—species of *Rubus* included in this list based upon specimens determined by E. J. Palmer, Arnold Arboretum.

Rubus occidentalis L. Black Raspberry.

Rubus frondosus Bigel. Leafy-flowered Blackberry.

Rubus alleghaniensis Porter. Mountain Blackberry.

620216—Yellow banks of the Little Miami. 620217.

Rubus flagellaris Willd. Dewberry.

Rubus procumbens Muhl.

Rubus trivialis Michx. Low Bush Blackberry.

620214—Taylor's old field, Banklick. (Kenton Co., Ky.) 620215.

ROSA—species of *Rosa* included in this list based upon specimens determined by E. J. Palmer, Arnold Arboretum.

Rosa setigera Michx. Prairie Rose. Climbing Rose.

Rosa setigera var. *tomentosa* T. & G.

620213.

Rosa blanda Ait. Smooth or Meadow Rose.

Rosa suffulta Greene.

Rosa palustris Marsh. Swamp Rose.

Rosa carolina, Auth. not L.

(This is the rose in the manuals as *R. carolina* L.)

620208—Ludlow's meadow below the spring.

620209—Ludlow's far end of bog. 620210—Wet, Ludlow's bog.

Rosa caroliniana L. Low or Pasture Rose.

Rosa humilis Marsh.

Rosa virginiana Mill.

(This is the rose in the manuals as *R. humilis* Marsh.)

620211—Ravine in the field beyond the meeting house near Madison Road.

§*Rosa Eglantaria* L. Sweetbrier.

Rosa rubiginosa L.

620212—Four miles north, Canal bridge.

Malaceae*

§*Pyrus communis* L. Pear.

Malus glaucescens Rehder. American Crab Apple.

Malus coronaria, Auth., not L.

Malus Malus (L.) Britton. Apple.

Pyrus Malus L.

Aronia melanocarpa (Michx.) Britton. Black Chokeberry.

Aronia nigra (Willd.) Britton.

Pyrus melanocarpa (Michx.) Willd.

Amelanchier canadensis (L.) Medic. June-berry. Service-berry.

* All species of the Malaceae included in this list based on specimens determined by E. J. Palmer, Arnold Arboretum.

Amelanchier laevis Wiegand. June-berry. Service-berry.

620183—"Mr. Rose got this 11 miles south of Cincinnati. From a tree in Rose's front yard, next to corner of Sixth and Walnut."

620184—On the precipitous bank of the Licking about three miles up—along the ridge beyond Levapeur's orchard.

620185—Longworth's garden. "He says it is native in vicinity of Cincinnati."

Crataegus armata Beadle. (Owl Creek, Campbell Co., Ky.)

Crataegus cerasina Sarg. (?)

Crataegus Crus-Galli L. Cockspur Thorn.

Crataegus mariettensis Sarg.

620187—Ludlow's edge of field.

620188—Edge of Ludlow's field about midway to the Laurel Oak spring.

Crataegus mollis (T. & G.) Scheele. Red-fruited Thorn.

620190—Levapeur's field. 620191—Riddle's. 620193.

620192—"This is not *C. mollis*, but I cannot place it. Has some resemblance to *C. austromontana* Ashe, but apparently not that species. We have a similar specimen collected by Dr. Gattinger, near Nashville, Tenn. in herb. here. E. J. P."

§*Crataegus monogyna* Jacq. Hawthorn. White or May Thorn.

("Has been confused with *C. Oxycantha* L.")

Crataegus Phaenopyrum (L. f.) Medic. Washington Thorn.

Crataegus cordata Ait.

Crataegus populnea Ashe. Gruber's Thorn.

(Owl Creek, Campbell Co., Ky.)

Crataegus pratensis Sarg.

620197—Bank of Licking on the peninsula above mouth of Levapeur's rivulet . . . on the steep acclivity.

Crataegus pruinosa (Wendl.) K. Koch. Waxy-fruited Thorn.

620189—"Not sufficient for determination. J. E. P."

620194—Stone's hill, side ridge.

620195—Taylor's old field, Banklick. (Kenton Co., Ky.)

Crataegus psoriensis Sarg.

Crataegus pubifolia Ashe.

(Owl Creek, Campbell Co., Ky.)

Crataegus punctata Jacq. Large-fruited or White Thorn. Dotted Haw.

620196—On the right bank of the river one mile above Taylor's dam, hanging over the run. (Campbell Co., Ky.)

620198—Up hill back of Stone's house. 620198—West side of Burnet's woods.

620201—Riddle's old field.

Crataegus punctata var. *aurea* Ait.

620200—At the base of the hill next to Este's prairie.

Crataegus repentina Sarg. (?)

Crataegus tomentosa L.

620202—Roadside, Banklick. (Kenton Co., Ky.)

620203—Banklick. (Kenton Co., Ky.)

Crataegus virella Ashe.

Crataegus Wilkinsonii Ashe.

(Elijas Creek, Boone Co., Ky.)

*Drupaceae**

Prunus americana Marsh. Wild Yellow or Red Plum.

* All species of the *Drupaceae* included in this list based on specimens determined by E. J. Palmer, Arnold Arboretum.

- Prunus hortulana* Bailey. Wild Goose Plum.
Prunus Munsoniana Wight & Hedrick.
Prunus angustifolia var. *varians* Wight & Hedrick. Chickasaw Plum.
Prunus pumila L. Sand or Dwarf Cherry.
 §*Prunus Cerasus* L. Sour Cherry.
 §*Prunus Avium* L. Sweet Cherry.
 §*Prunus Mahaleb* L. Mahaleb. Perfumed Cherry.
Prunus virginiana L. Choke Cherry.
 Padus nana (Du Roi) Roemer.
Prunus serotina Ehrh. Wild Black Cherry.
 Padus virginiana (L.) Mill.
 620186—Cincinnati.
 §*Amygdalus persica* L. Peach.
 Prunus persica (L.) Stokes.

Mimosaceae

- Acuan illinoensis* (Michx.) Kuntze. Illinois Mimosa.
 Desmanthus illinoensis (Michx.) MacM.

Caesalpinaceae

- Cercis canadensis* L. Redbud.
 620228—Woods, hilly. Lea's characterization of the habitat as "hilly" implies conditions different from the extensive rolling woods of his time. Redbud is not, here, a tree of "rich soil" but a tree of dry hillsides, and is most common on rocky south slopes.
Cassia marilandica L. Wild or American Senna.
 620227.
Cassia Medsgeri Shafer. Wild Senna.
Chamaecrista nictitans (L.) Moench. Sensitive Pea. Wild Sensitive Plant.
 Cassia nictitans L. (Campbell Co., Ky.)
Chamaecrista fasciculata (Michx.) Greene. Partridge Pea.
 Cassia Chamaecrista L.
Gleditsia triacanthos L. Honey Locust.
 620238—Riddle's field.
Gymnocladus dioica (L.) Koch. Kentucky Coffee-tree.
 620239.

Fabaceae

- Baptisia australis* (L.) R.Br. Blue False Indigo.
 620226—River bank.
 The plant still grows on the river bank, but far above and below those places visited by Lea.
 †*Baptisia tinctoria* (L.) R.Br. Wild Indigo. (Aiken catalog, 1904.)
 †*Baptisia leucantha* T. & G. Large White Wild Indigo.
 620225—Old field beyond the Duck Creek church, 6 or 7 miles on the Madison road.
 §*Medicago sativa* L. Alfalfa.
 §*Medicago lupulina* L. Black Medic.
 §*Melilotus alba* Desv. White Sweet Clover.
 §*Melilotus officinalis* (L.) Lam. Yellow Sweet Clover.
 §*Trifolium agrarium* L. Yellow or Hop-clover.
 §*Trifolium procumbens* L. Low Hop-clover.
 §*Trifolium incarnatum* L. Crimson Clover.

§*Trifolium arvense* L. Rabbit-foot Clover.

§*Trifolium pratense* L. Red Clover.

Trifolium reflexum L. Buffalo Clover.

620257—Clarkson's woods. 620258—Beach: Dayton (Ky.)

Trifolium stoloniferum Muhl. Running Buffalo Clover.

620259—Riddle's ploughed corn field.

Trifolium repens L. White Clover.

Psoralea Onobrychis Nutt. Sainfoil *Psoralea*.

620256—Ludlow's.

Amorpha fruticosa L. False Indigo. River-locust.

†*Cracca virginiana* L. Wild Sweet-pea. (Schaffner catalog, 1914.)

Tephrosia virginiana (L.) Pers.

Robinia Pseudo-Acacia L. Locust tree.

Astragalus carolinianus L. Milk Vetch.

Astragalus canadensis L.

620224—Right bank of Banklick on and near the top . . . $\frac{1}{2}$ way below the dam. (Kenton Co., Ky.)

A long and detailed description attached, giving points of difference from several descriptions of *A. carolinianus* and *A. canadensis*.

†*Phaca neglecta* T. & G. Cooper's Milk Vetch.

Astragalus neglectus (T. & G.) Sheldon.

620254—Stone's hill back of house.

(No record since 1883.)

§*Coronilla varia* L. Coronilla.

Meibomia nudiflora (L.) Kuntze.

Desmodium nudiflorum (L.) DC.

620236—Ludlow's.

Meibomia grandiflora (Walt.) Kuntze.

Desmodium grandiflorum (Walt.) DC.

620229—Stone's hill.

Meibomia pauciflora (Nutt.) Kuntze.

Desmodium pauciflorum (Nutt.) DC.

Meibomia Michauxii Vail.

Desmodium rotundifolium (Michx.) DC.

620237—Hills, woods, 3 miles northwest.

Meibomia canescens (L.) Kuntze.

Desmodium canescens (L.) DC.

620231—River shore, Columbia. 620232. 620240 —(Banklick) (Kenton Co., Ky.) 620241.

Meibomia bracteosa (Michx.) Kuntze.

Desmodium bracteosum (Michx.) DC.

620233.

Meibomia paniculata (L.) Kuntze.

Desmodium paniculatum (L.) DC.

620242— $3\frac{1}{2}$ miles NW.

‡*Meibomia viridiflora* (L.) Kuntze.

Desmodium viridiflorum (L.) DC.

620243—Bullock's hill.

Note with specimen: "Sent to Darl[ington] fellow spm. of this—reply 'comes nearer to *D. rigidum* Fl. Cestr. than to any of our other species, but the leaves are longer & more acute & the joints of the fruit are more rhomboid than in ours!' (lett. Sept. 29/38). This appears to me to agree quite as well or even more nearly with the description of *D. viridiflorum* in Fl. Cestr. & F. N. Am.

than it does with *D. rigidum*, in the former work. The stipules I have not observed. More spms. should be collected and examined. T.G.L. June /40."

Meibomia Dillenii (Darl.) Kuntze.

Desmodium Dillenii Darl.

620234—Clarkson's Gerardia woods. 620235—Clarkson's Gerardia woods, about half way down to fence and near the middle of woods.

‡*Meibomia canadensis* (L.) Kuntze. Showy Tick-trefoil.

Desmodium canadense (L.) DC.

620230—On the west side of Este's prairie near the ditch about 200 yards below the upper end—growing in a wet place.

Evidently uncommon even in Lea's time, for he notes: "These are the first spms. I have found in the vicinity of Cincinnati."

Lespedeza repens (L.) Bart. Creeping Bush Clover.

Lespedeza procumbens Michx. Trailing Bush Clover.

620248—Hills, 3½ miles NW.

Lespedeza violacea (L.) Pers. Bush Clover.

620251—Hills over Banklick. (Kenton Co., Ky.) 620252—Dry woods, 3½ NW.

620253—Lea's note: "This spm. is pronounced by Mr. Nuttall as positively not the sessiliflora, but the violacea of Fl. Cest." (This specimen appears to be another piece of No. 620251.)

Lespedeza frutescens (L.) Britton. Wand-like Bush Clover.

620246—3½ miles NW. 620250—Ludlow's.

Lespedeza virginica (L.) Britton.

620249—Hills, 3½ miles north. "Lespedeza reticulata frutescens. Differs from sessiliflora in being much branched, leaves on long petioles and oblong linear, legume hairy. From reticulata in its branching and hairy stem.

‡*Lespedeza hirta* (L.) Ell. Hairy Bush Clover.

620247—Clarkson's woods.

§*Lespedeza striata* (Thunb.) H. & A. Japan Clover.

Vicia Cracca L. Blue Vetch.

§*Vicia villosa* Roth. Hairy or Winter Vetch.

§*Vicia sativa* L. Spring Vetch.

§*Vicia angustifolia* L. Smaller Common Vetch.

‡*Lathyrus venosus* Muhl.

620244—Stone's hill, fence side. 620245—Back of Stone's.

Glycine Apios L. Ground Nut.

Apios Apios (L.) MacM.

Apios tuberosa Moench.

620223—Banklick. (Kenton Co., Ky.) Leaflets mostly acuminate at apex, from ½ to 2/3 as wide as long.

Falcata comosa (L.) Kuntze. Hog Peanut.

Amphicarpa monoica (L.) Ell.

Falcata Pitcheri (T. & G.) Kuntze.

Amphicarpa Pitcheri T. & G.

620222—Licking.

The common species here is *F. comosa*. In Lea's time, only this species was recognized. The two intergrade, *F. Pitcheri* occupying more open and wetter ground.

Strophostyles helvola (L.) Britton. Trailing Wild Bean.

620255—In sand.

Strophostyles pauciflora (Benth.) S. Wats. Small Wild Bean.

Geraniaceae

Geranium maculatum L. Wild Geranium. Crane's-bill.

620260—Woods.

Geranium carolinianum L. Carolina Crane's-bill.

§*Geranium dissectum* L. Cut-leaved Crane's-bill.

Erodium cicutarium (L.) L'Her. Stork's-bill. Alfilaria.

Oxalidaceae

OXALIS—species of yellow *Oxalis* included in this list based upon specimens determined by K. M. Wiegand, of Cornell University.

Oxalis violacea L. Violet Wood-sorrel.

Ionoxalis violacea (L.) Small.

620262—Woods.

Oxalis stricta L. Yellow Wood-sorrel.

Xanthoxalis stricta (L.) Small. (Erect and prostrate forms.)

Oxalis europaea Jord. f. *cymosa* (Small) Wieg.

Oxalis europaea Jord. f. *villicaulis* Wieg.

620263—Edge of field next to Clarkson's woods.

620264—Thicket beyond Burnet's woods.

620265—Thicket two miles back of Newport. (Campbell Co., Ky.)

Oxalis europaea Jord. between f. *cymosa* and f. *villicaulis*.

620261—Riddle's. 620266—Thicket back of Newport.

Oxalis grandis Small. Great Yellow Wood-sorrel.

Xanthoxalis grandis Small.

Lea was as much confused with his specimens of yellow *Oxalis* (*Xanthoxalis*) as is the modern collector. Only one of his specimens did he attempt to give a scientific name. All have copious notes giving such characters as relative lengths of stamens and styles, pubescence of styles and filaments, markings on petals, etc.

Linaceae

§*Linum usitatissimum* L. Flax.

Carthartolinum striatum (Walt.) Small. Ridged Yellow Flax.

Linum striatum Walt.

Carthartolinum virginianum (L.) Reichenb. Slender Yellow Flax.

Linum virginianum L.

Carthartolinum medium (Planch.) Small. Stiff Yellow Flax.

Linum medium (Planch.) Britton.

Balsaminaceae

Impatiens biflora Walt. Spotted Touch-me-not.

620305.

Impatiens pallida Nutt. Pale Touch-me-not.

Impatiens aurea Muhl.

620306—Woods.

Limnanthaceae

Floerkea proserpinacoides Willd. False Mermaid.

620282—Top of hill west of Mill creek. Collected by Mr. Clark. 620283.

Lea notes: "Stigma sometimes *trifid* (usually *bifid*) & the petals are conspicuously bearded at the base." Concerning habitat: "Eat. Man. notices it as growing in water, and Darl. in 'miry shaded places'—Here it has as yet been found in one station only, viz.—on the top of the hill west of Mill creek to the left of Lehman's house, in open woods among grass. It is here so plenty as to be grasped by the hands-full."

Our manuals still persist in assigning this plant to marshes and river banks, in which places it is never found in this region. Here it is a plant of rather open mesophytic woodlands.

Zygophyllaceae

§*Tribulus terrestris* L. Ground Burnut. Land Caltrop.

Rutaceae

Zanthoxylum americanum Mill. Prickly ash.

Xanthoxylum americanum Mill.

Ptelea trifoliata L. Hop Tree. Shrubby Trefoil.

620267—Ludlow's meadows. (flowers) 620268—Ludlow's meadows. (fruit). Samaras on this specimen are unusually large, one inch in diameter. "Young shrub 2-3 ft. high in a meadow which is mowed and they are cut down."

Simaroubaceae

§*Ailanthus glandulosa* Desf. Ailanthus. Tree-of-Heaven.

Polygalaceae

Polygala ambigua Nutt. Loose-spiked Milkwort.

Polygala verticillata var. *ambigua* (Nutt.) Wood.

Polygala viridescens L. Field or Purple Milkwort.

Polygala sanguinea L.

Polygala Senega L. Seneca Snakeroot.

Polygala Senega var. *latifolia* T. & G.

620269—Dry hard soil, field near Williamson's house. (Kenton Co., Ky.)

Euphorbiaceae

Phyllanthus carolinensis Walt.

Croton capitatus Michx. Capitate Croton.

Croton monanthogynus Michx. Single-fruited Croton.

(The first record for this species here is 1913; since that time it has become abundant on gravelly soil.)

Acalypha ostryaefolia Ridd. Hornbeam Three-seeded Mercury.

620270—In the garden as an annual weed.

620271—Cultivated ground.

Recorded only from Washington County in Ohio, until 1919, when the plant was found again in Hamilton County, after there had been no record of it in this region for 80 years. Now quite common.

Acalypha virginica L.

620272—Grass field beyond Cassily's.

Acalypha virginica var. *Deamii* Weatherby.

620273—Woods. (Determined by C. A. Weatherby, Gray Herbarium.)

Acalypha gracilens A. Gray.

Chamaesyce maculata (L.) Small. Milk Purslane.

Euphorbia maculata L.

620276—Bank of Banklick above third rapid. (Kenton Co., Ky.)

620277—Banklick dam; spreading on the planks in a dense circular mass three feet diameter.

Chamaesyce Preslii (Guss.) Arthur. Large or Upright Spotted Spurge.

Euphorbia Preslii Guss.

620275.

Dichrophyllum marginatum (Pursh.) Kl. & Garcke. Snow-on-the-Mountain.

Euphorbia marginata Pursh.

Tithymalopsis corollata (L.) Kl. & Garcke. Flowering Spurge.

Euphorbia corollata L.

620274.

Tithymalus obtusatus (Pursh.) Kl. & Garcke. Blunt-leaved Spurge.

Euphorbia obtusata Pursh.

620278—Riddle's field.

§*Tithymalus Cyparissias* (L.) Hill. Cypress Spurge.

Euphorbia Cyparissias L.

Tithymalus commutatus (Engelm.) Kl. & Garcke. Tinted Spurge.

Euphorbia commutata Engelm.

620279—Inundated bottoms, Mill creek—Ludlow's dam. 620280—Stone's hill.

§*Tithymalus falcatus* (L.) Kl. & Garcke.

Euphorbia falcata L.

(Specimen in Ohio State Herbarium, Columbus, from Cincinnati.)

Poinsettia dentata (Michx.) Small. Toothed Spurge.

Euphorbia dentata Michx.

Poinsettia heterophylla (L.) Kl. & Garcke. Painted Leaf.

Euphorbia heterophylla L.

Callitrichaceae

Callitriche Austini Engelm. Terrestrial Water-Starwort.

Callitriche deflexa A. Br., var. *Austini* (Engelm.) Hegelm.

620281—Wet woods about seven miles on Madison road.

Callitriche heterophylla Pursh. Larger Water-Starwort.

Anacardiaceae

Rhus copallina L. Dwarf Sumac.

620284—"Got by Mr. Clark at Alexandria, Ky., 14 miles southeast of Cin.—

he says it is abundant and nearly as tall as the *R. typhina*."

The plant is in general absent from the immediate vicinity of Cincinnati; it is locally abundant nearby.

Rhus hirta (L.) Sudw. Staghorn Sumac.

Rhus typhina L.

620287—Levapeur's lot, south of Covington.

620288—Three miles south Cincinnati. [Probably Kenton Co., Ky.]

Rhus glabra L. Smooth Sumac.

620285.

Schmaltzia crenata (Mill.) Greene. Fragrant Sumac.

Rhus aromatica Ait.

Rhus canadensis Marsh.

†*Toxicodendron Vernix* (L.) Kuntze. Poison Sumac.

Rhus Vernix L.

620289—Este's bog.

Toxicodendron radicans (L.) Kuntze. Poison Ivy.

Rhus radicans L.

Rhus Toxicodendron L. in part.

620286—Riddle's, wet ground.

Ilicaceae

Ilex verticillata (L.) A. Gray. Winterberry. Black Alder.

620290—Seven miles on Madison road (at the end of the thicket, side of the oak field.)

Celastraceae

Euonymus obovatus Nutt. Running Strawberry Bush.

Euonymus obovatus Nutt.

Euonymus atropurpureus Jacq. Wahoo.

620292. 620293—Banklick. (Kenton Co., Ky.)

Celastrus scandens L. Shubby or Climbing Bittersweet.
620291—Ludlow's.

Staphyleaceae

Staphylea trifolia L. Bladdernut.

Aceraceae

Acer saccharinum L. Silver Maple.

620294—Fourth street. (flowers) 620295—Bullock's ravine. (fruit and leaves)
620296—Riddle's meadow. (leaves) 620297—Riddle's meadow. (flowers)

Acer rubrum L. Red Maple.

620299—Banklick flat. (Kenton Co., Ky.)
620300—In the woods of Banklick flat.

Acer saccharum Marsh. Sugar Maple.

Acer nigrum Michx. Black Sugar Maple.

Acer saccharum var. *nigrum* (Michx.f.) Britton.
620301—Stone's hill.

Acer Negundo L. Box Elder.
620298.

Aesculaceae

Aesculus glabra Willd. Fetid Buckeye. Ohio Buckeye.

620304—Riddle's meadow and old field.

Aesculus octandra Marsh. Yellow or Sweet Buckeye.

620302—Stone's rivulet. 620303—Hill reservoir.

Rhamnaceae

Rhamnus cathartica L. Buckthorn.

Rhamnus lanceolata Pursh. Buckthorn.

620309—At the upper end of Este's bog six or seven miles north of Cincinnati.

Ceanothus americanus L. New Jersey Tea.

620307—Watson's hill over Banklick. (Kenton Co., Ky.)
620308—Hills $3\frac{1}{2}$ north.

Vitaceae

Vitis Labrusca L. Northern Fox Grape.

Vitis aestivalis Michx. Summer Grape.

620310—Taylor's old Banklick field. (Kenton Co., Ky.)
620311—Ravine in the field going to the wet woods on the Madison road.

Vitis cinerea Engelm. Sweet Winter Grape.

Vitis vulpina L. Riverside or Sweet-scented Grape.

Vitis cordifolia Michx. Frost Grape.

620312—(Clarkson's)

Ampelopsis cordata Michx.

Cissus Ampelopsis Pers.

Parthenocissus quinquefolia (L.) Planch. Virginia Creeper.

Psedera quinquefolia (L.) Greene.

Parthenocissus quinquefolia var. *laciniata* Planch.

Psedera vilacea (Knerr) Greene.

Tiliaceae

Tilia americana L. Basswood.

Tilia heterophylla Vent. White Basswood.

620313—Vine near the corner of Fourth. 620314—Near Cincinnati.

Malvaceae

Althaea rosea L. Hollyhock.

§*Malva rotundifolia* L. Low Mallow. Cheeses.
620317.

§*Malva verticillata* L. Whorled Mallow. Curled Mallow.
Malva verticillata crispa L. or *Malva crispa* L. is the form found.

†*Napaea dioica* L. Glade Mallow.
620318—From J. Clark. 620319—Riddle's, margin of pond.

§*Sida spinosa* L. Indian or False Mallow.
620320.

§*Abutilon Abutilon* (L.) Rusby. Velvet Leaf.
Abutilon Theophrasti Medic.

620315—Waste places.

†*Hibiscus militaris* Cav. Halberd-leaved Rose Mallow.
620316—Pond near mouth of Little Miami.

§*Hibiscus Trionum* L. Flower-of-an-hour.

Hypericaceae

Ascyrum hypericoides L. St. Andrew's Cross. (Shaffner catalog, 1914.)

Hypericum prolificum L. Shrubby St. John's-wort.
620324—Banklick. (Kenton Co., Ky.)

Hypericum cistifolium Lam. Round-podded St. John's-wort.
Hypericum sphaerocarpum Michx.

§*Hypericum perforatum* L. Common St. John's-wort.
620323—Este's prairie bog. "This has not been found in the vicinity of Cincinnati until now, when I collected it in Este's wet prairie, on the bank of a ditch where it is growing luxuriantly in a patch of six or eight feet. It will doubtless spread and become a troublesome weed to farmers."
It is now common.

Hypericum punctatum Lam. Spotted St. John's-wort.
Hypericum maculatum Walt.

620321—d. woods.

Hypericum mutilum L. Small-flowered St. John's-wort.
620322.

Hypericum canadense L. (Clark catalog.)

Hypericum Drummondii (Grev. & Hook.) T. & G.

Sarothra gentianoides L. Orange-grass. Pineweed.

Hypericum gentianoides (L.) B.S.P.

Violaceae

VIOLA—The writer's specimens of those species of *Viola* marked * have been determined by Ezra Brainerd.

Viola palmata L.* Early Blue Violet.
620330—Hills, Banklick. (Kenton Co., Ky.)

Viola triloba Schwein.* Three-lobed Violet.

Viola papilionacea Pursh.* Common Blue Violet.
620328—East side Stone's hill. 620329.

Viola sororia Willd.* Woolly Blue Violet.
620327—Banklick hills. (Kenton Co., Ky.) 620333—Dry thickets and open wds.

Viola hirsutula Brainerd. Southern Wood Violet.

Viola affinis LeConte.*

Viola cucullata Ait.* Marsh Blue Violet.

Viola sagittata Ait. Arrow-leaved Violet.

Viola lanceolata L. Lance-leaved Violet.

Viola eriocarpa Schwein.* Smooth Yellow Violet.

Viola scabriuscula Schwein.

620331—Taylor's woods. (Kenton Co., Ky.)

This species intergrades with *V. pubescens*; the Lea specimen is nearer to *V. eriocarpa*.

Viola pubescens Ait. Hairy or Downy Yellow Violet.

620332—Woods next to Clarkson's, back of Bryan's.

Viola canadensis L. Canada Violet.

620326.

Viola striata Ait. Pale Violet.

620334—Burnet's woods. 620335—Hillside below Stone's rivulet.

Viola rostrata Pursh. Long-spurred Violet.

Viola Rafinesquii Greene. Field Pansy.

620336—Riddle's, upper meadow. 620337—meadow. 620338.

Viola—hybrids:

Viola sororia × *papilionacea**

Viola hirsutula × *papilionacea**

Viola rostrata × *striata**

Cubelium concolor (Forst.) Raf. Green Violet.

Hybanthus concolor (Forst.) Spreng.

620325—Stone's hill.

Passifloraceae

Passiflora lutea L. Yellow Passion-flower.

620339.

Cactaceae

Opuntia humifusa Raf. Prickly Pear.

Opuntia Rafinesquii Engelm.

Opuntia tortispina Engelm.

Thymeleaceae

Dirca palustris L. Leatherwood. Moosewood.

Lythraceae

‡*Ammannia coccinea* Rottb.

620341—On the margin of the pond. . . near the mouth of the Little Miami.

Rotala ramosior (L.) Koehne. Tooth-cup.

620340—Pond, Columbia.

Lythrum alatum Pursh. Wing-angled Loosestrife.

620342—Este's prairie at the upper end. 620343—Dayton.

Parsonia petiolata (L.) Rusby. Blue Waxweed. Clammy Cuphea.

Cuphea petiolata (L.) Koehne.

Melastomaceae

Rhexia virginica L. Meadow-beauty.

620344—Lower meadow next the woods, about seven miles on the Madison road.

(Now only in meadows at the eastern outskirts of our region.)

Onagraceae

Isnardia palustris L. Marsh Purslane.

Ludvigia palustris (L.) Ell.

620348—Edge of pond, Columbia.

Ludvigia polycarpa Short & Peter. False Loosestrife.

Ludvigia alternifolia L. Seed-box. Rattle-box.

620347—Banklick woods in damp place. (Kenton Co., Ky.)

Epilobium coloratum Muhl. Purple-leaved Willow-herb.

Oenothera biennis L. Common Evening-Primrose.

Onagra biennis (L.) Scop.

620349—(Mill creek?) 620350.

Oenothera Oakesiana Robbins. Evening Primrose.

Onagra Oakesiana (A. Gray) Britton.

Raimannia laciniata (Hill) Rose. Cut-leaved Evening Primrose.

Oenothera laciniata Hill.

Kneiffia pratensis Small. Meadow Sundrops.

Oenothera pratensis (Small) Robinson.

Kneiffia perennis (L.) Pennell. (Det. by F. W. Pennell.)

Oenothera pumila L.

Kneiffia tetragona (Roth) Pennell. (Det. by F. W. Pennell.)

Oenothera tetragona Roth.

Kneiffia pratensis Small \times *K. tetragona* (Roth)? (Det. by F. W. Pennell.)

Gaura biennis L.

620346.

Circaea lutetiana L. Enchanter's Nightshade.

620345—Woods.

Haloragidaceae

Myriophyllum spicatum L. Water Milfoil.

†*Myriophyllum humile* (Raf.) Morong. Low Water Milfoil.

(Clark catalog, 1852, as *M. ambiguum*)

‡*Myriophyllum pinnatum* (Walt.) B. S. P. Pinnate Water Milfoil.

Myriophyllum scabratum Michx. (Clark catalog, 1852.)

Araliaceae

‡*Aralia spinosa* L. Hercules' Club. (Clark catalog, 1852; James catalog, 1879.)

Aralia racemosa L. American Spikenard.

Panax quinquefolium L. Ginseng.

620351—Burnet's woods.

Ammiaceae (Umbelliferae)

Eryngium aquaticum L. Rattlesnake Master. Button Snakeroot.

Eryngium yuccifolium Michx.

Sanicula marylandica L. Black Snakeroot or Sanicle.

520366—Hills, Mill creek.

Sanicula gregaria Bicknell. Clustered Snakeroot.

Sanicula canadensis L. Short-styled Snakeroot.

620363—Hills over Banklick. (Kenton Co., Ky.)

620364—Burnet's field, edge of woods. 620365—Burnet's field, edge of woods.

Sanicula trifoliata Bicknell. Large-fruited Snakeroot.

§*Daucus Carota* L. Wild Carrot.

§*Torilis Anthriscus* (L.) Gmel. Erect Hedge Parsley.

Caucalis Anthriscus (L.) Huds.

Washingtonia Claytoni (Michx.) Britton. Hairy Sweet Cicely.

Osmorhiza Claytoni (Michx.) Clarke.

620372—Woods.

Washingtonia longistylis (Torr.) Britton. Smooth Sweet Cicely.

Osmorhiza longistylis (Torr.) DC.

620370—Riddle's thicket bank. 620371—Riddle's grassy bank.

Washingtonia longistylis var. *villicaulis* Fernald.

Osmorhiza longistylis var. *villicaulis* Fernald.

Chaerophyllum procumbens (L.) Crantz. Spreading Chervil.

620354. 620355—Bottom land.

Chaerophyllum procumbens var. *Shortii* T. & G.

620356—Grown from seed from Riddle's.

Chaerophyllum Teinturierii Hook.

Deringa canadensis (L.) Kuntze. Honewort.

Cryptotaenia canadensis (L.) DC.

620360—Riddle's copse bank.

§*Pastinaca sativa* L. Wild Parsnip.

Heracleum lanatum Michx. Cow Parsnip.

620362—Mill creek towards Ludlow's; inundated flat, not common.

This plant is rare in the Cincinnati region; one record, 1884, Cumminsville, is from approximately the same location as Lea's specimen; another, 1929, is from the flood plain of the Little Miami River.

Lea's plant differs from *H. laratum* as described in manuals in leaf characters as noted in description on Lea's specimen:

"Cauline leaves on inflated petioles 2-3 in. long, ternate; lateral leaflets sessile; terminal on petiole, sub-rhomboid, 3 lobed, coarsely toothed. Radical leaves very large, lamina 16 in. long and 20 in. broad on petiole 18-24 in. long; ternate, lobed, oblique and acuminate at base, the lamina extended along the midrib below the first pair of primary veins." (Italics are author's.)

There is no radical leaf with the specimen. Rays of the umbel 14-16, slender, 2-3½ in. long in flower, 2¾-4½ in. long in fruit. Fruiting pedicels 8"-9" long. The petioles of the reduced leaves in the inflorescence about ½ in. broad.

‡*Angelica villosa* (Walt.) B. S. P. Hairy Angelica.

620352—Dry bank of upper end of ravine near roadside beyond Williamson's barn. (Licking River near Banklick, Kenton Co., Ky.)

Oxypolis rigidius (L.) Raf. Cowbane.

Oxypolis rigidior (L.) Coulter & Rose.

620353—Ludlow's.

Thaspium trifoliatum (L.) Britton. Meadow Parsnip.

Thaspium trifoliatum aureum (Nutt.) Britton.

Thaspium aureum Nutt.

620369—Ravine in Taylor's, Banklick. (Kenton Co., Ky.)

Thaspium barbinode (Michx.) Nutt. Hairy-jointed Meadow Parsnip.

620368—Ravine in Taylor's field, Banklick. (Kenton Co., Ky.)

Thaspium pinnatifidum (Buckl.) A. Gray. Cut-leaved Meadow Parsnip.

Taenidia integerrima (L.) Drude. Yellow Pimpernel.

Pimpinella integerrima (L.) A. Gray.

620376—Hills, 3 mi. NW.

Zizia aurea (L.) Koch. Early Meadow Parsnip.

620373—Ludlow's meadows.

620374—Ludlow's meadow. "Mr. Nuttall says this is *Zizia aurea*."

620375—Ludlow's meadow. (fruit.)

Zizia cordata (Walt.) DC. Heart-leaved Alexanders.

Erigenia bulbosa (Michx.) Nutt. Pepper-and-salt. Harbinger of Spring.

620361—Second hill beyond reservoir. (Leaf segments lanceolate, acute; pedicels, in fruit, short, mostly 1 mm. or less, longest 1½ mm.)

Lea evidently noticed departure of this specimen from descriptions, for the label bears the note: "This is probably the second species ? which Nuttall mentions as having received a drawing from Dr. Short."

Both this and the form with obtuse leaf segments occur in the region.

§*Conium maculatum* L. Poison Hemlock.

‡*Sium cicutaefolium* Schrank. Hemlock Water Parsnip.

620367—Ludlow's, swamp.

Cicuta maculata L. Water Hemlock.

620359—Wet.

Cicuta bulbifera L. Bulb-bearing Water Hemlock.

620357. 620358. The nature of the bulblets is the subject of a long appended note:

"Bulbs of *Cicuta bulbifera*.

"The bulbs are oval, sessile in the axils of bracts or rudimentary leaves: green and succulent at base; at the summit the scales become free and are membranous and tinged with purple, each overlapping and inclosing the other, losing their thinness and becoming succulent toward the centre; within all these envelopes, are two rudimentary stems or leaves, probably the latter, as the sheath of the longer one and its divided summit are very evident. In several instances these rudimentary leaves or stems had broke through the inclosing scales. The longitudinal section of the bulb shews it filled with granular bodies, easily detached from each other. I could not perceive with my lens any spiral vessels etc (as in *Polygonum viviparum*. See Ann. Nat Hist. 5, No. 32 p. 298; see also No. 34, p. 59.) The rudimentary leaves or stems could not be traced further than the fleshy cuticle of the bulb, from which they appear to proceed. "I have today put 12 of these bulbs (or buds) in a bottle with some wet earth and corked it very tight. So far these bulbs appear to be buds and I think will reproduce. Oct. 13/40.

"April 14/41—During the winter I examined the bulbs at various times and saw no appearance of sprouting. For several weeks (March and April) they were not looked at till today when they have thrown up stems of 4-5 inches in length. There are commonly two stems springing together from the nucleus or centre of the bulb from its summit. They are greenish white. These stems are naked, terminating at the apex in three small leaves which are now 2 or 3 cleft. The radicles about 4 are 1 inch long, proceeding from the internal fleshy part of the bulb near its summit, either above the membranous tips of the outer scales or rarely towards the base of the bulb and penetrating through the outer scales (see two spms. stuck on paper and put with full grown spm.)"

The two stems seem to be very elongate and slender petioles, each bearing a 3-parted leaf at its apex.

§*Carum Carui* L. Caraway.

Carum Carvi L.

Cornaceae

CORNUS—Specimens of *Cornus* determined or verified by E. J. Palmer, Arnold Arboretum.

Cornus Amomum Mill. Kinnikinnik.

Cornus obliqua Raf.

620381—Este's bog at ditch bank. 620382—In boggy place near Ludlow's house.

Cornus asperifolia Michx. Rough-leaved Cornel or Dogwood.

620377—Upper end of Ludlow's fields in boggy part. 620383.

Cornus racemosa Lam. Panicked Cornel.

Cornus femina Mill.

Cornus candidissima Marsh.

Cornus paniculata L'Her.

620379—Clarkson's woods. 620380—(Dayton).

Cornus alternifolia L. Alternate-leaved Dogwood.

Cynoxylon floridum (L.) Raf. Flowering Dogwood.

Cornus florida L.

620378.

Nyssa sylvatica Marsh. Sour Gum. Black Gum.

620384—Back of Covington near the foundry. (staminate and pistillate flowers)

620385—Roadside to Banklick. (Kenton Co., Ky.) (staminate flowers)

620386—(fruit) 620387—(pistillate flowers)

*Pyrolaceae**Pyrola elliptica* Nutt. Shin-leaf.

(Known in the region from only one patch.)

Chimaphila maculata (L.) Pursh. Spotted Wintergreen. Pipsisewa.

(Known in only one area in the region.)

*Monotropaceae**Monotropa uniflora* L. Indian Pipe.

620391—Woods.

Hypopitys lanuginosa (Michx.) Nutt. Hairy Pine-sap.*Monotropa lanuginosa* Michx.620388—Woods 2 mi. NW. 620389—Hills $3\frac{1}{2}$ mi. NW. 620390—Dry and thin soil, ridge of hill at Este's prairie.*Primulaceae**Samolus floribundus* H. B. K. Water Pimpernel. Brookweed.

620398.

Lysimachia quadrifolia L. Cross-wort. Whorled Loosestrife.

620397—Williamson's ravines. (Kenton Co., Ky.) (One stem has all leaves except those from upper three nodes, either opposite or alternate.)

§*Lysimachia Nummularia* L. Money-wort.*Steironema ciliatum* (L.) Raf. Fringed Loosestrife.

620393.

Steironema lanceolatum (Walt.) A. Gray. Lance-leaved Loosestrife.620394—Woods, hills, 3 mi. north. (A relatively broad-leaved form, with shorter and broader leaves from the lower half of the stem.) 620395—Hills $3\frac{1}{2}$ mi. north. 620396—Clarkson's, shady woods rooting in patches. (or) Found in cespitose beds, dry knob near Williamson's house. (Kenton Co., Ky.) (One specimen, two labels.)§*Anagallis arvensis* L. Red or Scarlet Pimpernel. Poor Man's Weather-glass.*Dodecatheon Meadia* L. Shooting Star.

620392—No locality or habitat is given with the specimens; they are of the robust and many flowered form occurring here on steep dry hillsides in woods, where there is a stiff clay soil derived from the decomposition of limestones. Another form, very much smaller and fewer flowered, grows on steep slopes where the soil is sandy or pebbly. Neither form is ever found here on prairies or moist cliffs.

*Ebenaceae**Diospyros virginiana* L. Persimmon.

620399.

*Oleaceae**Fraxinus americana* L. White Ash.

620401—Burnet's woods. 620402—Stone's. 620406—Riddle's meadow.

Fraxinus biltmoreana Beadle. Biltmore Ash.

620400—Hill below and back of Mrs. Lee's. (Det. by E. J. Palmer)

620407—Top of hill back of Mrs. Lee's. (Det. by E. J. Palmer)

Fraxinus pennsylvanica Marsh. Red Ash.*Fraxinus pennsylvanica* var. *lanceolata* (Borkh.) Sarg. Green Ash.

Fraxinus quadrangulata Michx. Blue Ash.

620403—Road beyond reservoir. 620404. 620405—Riddle's meadow.

620408—Left bank of the Little Miami about 1/2 mile below Armstrongs mill.

620409—1/4 mi. east of reservoir.

Gentianaceae

Sabbatia angularis (L.) Pursh. Rose-Pink. Rose Gentian.

620413—Clarkson's field next the woods.

Gentiana quinquefolia L. Stiff Gentian.

Gentiana quinquefolia var. *occidentalis* (A. Gray) A. S. Hitch.

620410—Ludlow's.

Dasystephana Saponaria (L.) Small. Soapwort Gentian. Harvest Bells.

Gentiana Saponaria L.

620411—Dry margin of rivulet, upper end of Taylor's meadow, Banklick. (Kenton Co., Ky.)

This is listed in Lea's catalog as *Gentiana Andrewsii*; Lea's label is *Gentiana Saponaria*.

Grew also in Este's bog, as indicated by label on *Cyperus strigosus*: "Este's bog over the ditch next the hillside where the *Gentiana Saponaria* grows."

Now found only at the eastern outskirts of the region.

Dasystephana flavida (A. Gray) Britton. Yellowish Gentian.

Gentiana flavida Gray.

Frasera carolinensis Walt. American Columbo.

Obolaria virginica L. Pennywort.

620412—Banklick woods. (Kenton Co., Ky.)

Apocynaceae

§*Vinca minor* L. Periwinkle. Myrtle.

*Apocynum medium** Greene. Dogbane.

620414—Ravine towards Banklick. (Kenton Co., Ky.) (Fide R. E. Woodson, Jr.)

Apocynum cannabinum L. Indian Hemp.

620415—Ludlow's orchard. (Fide R. E. Woodson, Jr.)

Apocynum cannabinum var. *pubescens* (Mitchell) A. DC. Velvet Dogbane.

Apocynum pubescens R. Br.

Apocynum cannabinum var. *glaberrimum* A. DC. Smooth Dogbane.

Asclepiadaceae

Asclepias tuberosa L. Butterfly-weed. Pleurisy-root.

620421—Ludlow's sandy field. "This specimen is from a stem that had been cut down in an oats field, and is the only one I have seen in our vicinity."

This species has always been uncommon here, though it is very abundant about 75 miles east, and not rare 30 miles east.

Asclepias purpurascens L. Purple Milkweed.

620416—Taylor's fern ravine. (Campbell Co., Ky.)

Asclepias incarnata L. Swamp Milkweed.

620417—Riddle's field.

Asclepias exaltata (L.) Muhl. Poke or Tall Milkweed.

Asclepias phytolaccoides Pursh.

620418—Ludlow's, open ground, not in shade.

* Nomenclature of *Apocynum* according to Woodson, Studies in the Apocynaceae. Ann. Mo. Bot. Garden, vol. 17, Nos. 1 and 2. 1930.

Asclepias quadrifolia Jacq. Four-leaved Milkweed.

620419—(Mill creek valley).

Asclepias syriaca L. Common Milkweed. Silkweed.

620420—(Two specimens, differing in color of flowers and amount of pubescence.)

Gonolobus laevis Michx. Angle-pod.

Ampelanus albidus (Nutt.) Britton.

620422—Ohio shore three miles above Cincinnati. On river bank below Pleasant rivulet, Ky. side.

†*Acerates viridiflora* (Raf.) Eaton. Green Milkweed. (Clark catalog, 1852.)

Vincetoxicum obliquum (Jacq.) Britton.

Vincetoxicum Shortii (A. Gray) Britton.

620423—Clarkson's hillside. (rare) 620424—Three miles NW.

(The inclusion of *Vincetoxicum gonocarpus* Walt. in some local lists is probably due to the appearance in Lea's catalog of the name *Gonolobus macrophyllus*, under which name the two specimens above are recorded.)

Convolvulaceae

Ipomoea pandurata (L.) Meyer. Wild Potato Vine.

620426—Banklick. (Kenton Co., Ky.) 620427—Cumminsville.

Ipomoea lacunosa L. Small-flowered White Morning Glory.

620425—Corn fields, Columbia.

§*Ipomoea purpurea* (L.) Lam. Morning Glory.

§*Ipomoea hederacea* Jacq. Ivy-leaved Morning Glory.

620432—Boty. hill.

Convolvulus sepium L. Hedge Bindweed.

620428—Millcreek.

Convolvulus repens L. Trailing Bindweed.

Convolvulus sepium var. *pubescens* (Gray) Fernald.

620429—Three mi. N.W.

(*Convolvulus spithameus* L. of Lea's catalog should be referred to this species; this is probably true also of later catalogs.)

Convolvulus arvensis L. Small Bindweed.

Cuscutaceae

Cuscuta Polygonorum Engelm. Smartweed Dodder.

Cuscuta obtusiflora HBK.

Cuscuta Coryli Engelm. Hazel Dodder.

Cuscuta Gronovii Willd. Love-vine.

620430—Edge of Riddle's pond. This grows quite high on tall Asters.

620431—On *Actinomeris squarrosa*, in Riddle's field.

Cuscuta arvensis Beyrich.

Polemoniaceae

Phlox paniculata L.

620436—Riddle's copse.

Phlox maculata L.

620435.

†*Phlox carolina* L. (Fide E. T. Wherry.)

620434—About 7 miles on the Madison road, at the ravine thicket.

Phlox divaricata L. Wild Blue Phlox.

620433—1½ mile over Banklick dam. (Kenton Co., Ky.) (A specimen with white flowers and pale stems.)

Polemonium reptans L. Greek Valerian.

620437—Woods.

In addition to the typically glabrous form, a softly pubescent variety is locally abundant.

Hydrophyllaceae

Hydrophyllum virginianum L.

Hydrophyllum virginicum L.

620440—From Longworth's garden—he got it from Yellow Springs or from the mountains. (The flowers are deep purple.)

The deep purple color does not seem to be related to higher altitudes (as is suggested in Britton and Brown), but is a varietal and persistent character. Dark purple-flowered plants brought from 4000 ft. in the mountains of Virginia by the writer have been reproducing freely from seed in Cincinnati for 20 years and the offspring have flowers as purple as the original plants. This was evidently the case with Longworth's plants, also.

Hydrophyllum macrophyllum Nutt. Large-leaved Waterleaf.

620439—Woods.

Hydrophyllum appendiculatum Michx. Waterleaf.

620441.

Hydrophyllum canadense L. Broad-leaved Waterleaf.

620438—Riddle's.

Phacelia bipinnatifida Michx.

620442—Taylor's woods. (Campbell Co., Ky.)

Phacelia Purshii Buckl.

620443.

Known locally under the common name of "Miami Mist," probably because of the large areas of misty blue of this plant in both Miami valleys.

Boraginaceae

§*Heliotropium indicum* L. Indian Heliotrope.

§*Cynoglossum officinale* L. Hound's tongue.

620444.

Cynoglossum virginianum L. Wild Comfrey.

620445—Shady woods, Riddle's.

§*Lappula Lappula* (L.) Karst. European Stickseed.

Lappula echinata Gilbert.

Lappula virginiana (L.) Greene. Virginia Stickseed.

620446—Open woods.

Mertensia virginica (L.) DC. Virginia Cowslip. *Mertensia*. Bluebells.

620450—Riddle's thicket.

Myosotis arvensis (L.) Hill. Field Scorpion-grass.

Myosotis virginica (L.) B. S. P. Spring Scorpion-grass.

Myosotis macrosperma Engelm.

Myosotis virginica var. *macrosperma* (Engelm.) Fernald.

620449—Wet woods towards Madison.

While both *Myosotis virginica* and *M. macrosperma* (which may be only a variety of *M. virginica*) occur in this region, they are found in very unlike habitats. *M. virginica* is in dry fields; *M. macrosperma* in wet woods (pin oak or mixed hydromesophytic forests of glacial flats).

§*Lithospermum arvense* L. Corn Gromwell.

620447—In Taylor's field, Newport, next to the old Race ground. "This is the first time I have seen this plant here, and this is the beginning of its being introduced." (Lea)

L. arvense is now very abundant.

Lithospermum latifolium Michx. American Gromwell.

620448—Stone's hill.

Lithospermum canescens (Michx.) Lehm. Hoary Puccoon.

§*Symphytum officinale* L. Comfrey.

§*Echium vulgare* L. Viper's Bugloss. Blueweed.

Verbenaceae

Verbena urticifolia L. White or Nettle-leaved Vervain.

Verbena hastata L. Blue or False Vervain.

Verbena angustifolia Michx. Narrow-leaved Vervain.

Verbena stricta Vent. Hoary Vervain.

620451—Roadside between Riddle's and Gilmore's.

Verbena bracteosa Michx. Large-bracted Vervain.

Verbena canadensis (L.) Britton. Large-flowered Verbena.

Lippia lanceolata Michx. Fog-fruit.

620452—Banklick. (Kenton Co., Ky.)

Labiatae

§*Ajuga reptans* L. Bugle Weed.

§*Ajuga genevensis* L. Erect Bugle Weed.

Teucrium canadense L. Wood Sage. American Germander.

620491—Hillside, Stone's. This specimen has the stem almost glabrous; leaves not canescent beneath; bracts not canescent.

620492—Ohio shore.

Isanthus brachiatus (L.) B. S. P. False Pennyroyal.

620457—Above Ludlow's.

Trichostema dichotoma L. Blue Curls. Bastard Pennyroyal.

Scutellaria lateriflora L. Mad-dog Skullcap.

620484.

Scutellaria incana Muhl. Downy Skullcap.

Scutellaria canescens Nutt.

620479—Ludlow's, moist ground. 620480.

Scutellaria cordifolia Muhl. Heart-leaved Skullcap.

Scutellaria versicolor Nutt.

620481.

Scutellaria parvula Michx.

620486—Clarkson's. "This is the only time I have found this—it is confined to a small space in a field with a few scattered trees next to Clarkson's woods, and between it and an old log house near the hollow."

There is only one record for this species since Lea's collection; that is of specimens collected in 1908 not over a mile, if that far, from his station.

Scutellaria nervosa Pursh. Veined Skullcap.

620482—Banklick. (Kenton Co., Ky.) 620483—Open woods.

620485—Woods in front of Howell's back of Covington.

§*Marrubium vulgare* L. Horehound.

620465—Hill sides.

Agastache nepetoides (L.) Kuntze. Catnep Giant Hyssop.

620459.

Agastache scrophulariaefolia (Willd.) Kuntze. Figwort Giant Hyssop.

620460—Ravine beyond Longworth's vineyard, 4 miles north.

§*Nepeta Cataria* L. Catnip.

620472.

- §*Glechoma hederacea* L. Ground Ivy.
Nepeta hederacea (L.) Trevisan.
 620455.
- Prunella vulgaris* L. Self-heal.
 620473.
- Dracocephalum virginianum* L. Dragon-head. Lion's Heart.
Physostegia virginiana (L.) Benth.
- Synandra hispidula* (Michx.) Britton. Synandra.
 620490.
- §*Leonurus Cardiaca* L. Motherwort.
 620458.
- §*Leonurus Marrubiastrum* L. Hoarhound Motherwort.
- §*Lamium amplexicaule* L. Henbit.
- §*Lamium purpureum* L. Red Dead Nettle.
- Stachys tenuifolia* Willd. Smooth Hedge Nettle.
 620487—Ludlow's. 620488.
- Stachys aspera* Michx. Rough Hedge Nettle.
Stachys tenuifolia var. *aspera* (Michx.) Fernald.
- Stachys cordata* Riddell. Light green Hedge Nettle.
 620489—Ravines about Williamson's house.
- Salvia lyrata* L. Lyre-leaved Sage.
- §*Salvia pratensis* L. Meadow Sage.
- Monarda didyma* L. Oswego Tea.
- Monarda fistulosa* L. Wild Bergamot.
 620470—Hills beyond Stone's.
- Monarda punctata* L. Horse-mint.
- Blephilia ciliata* (L.) Raf. Downy Blephilia.
 620469—Hills, fields.
- Blephilia hirsuta* (Pursh.) Torr. Hairy Blephilia.
 620471—Woods, fields, fence sides.
- Hedeoma pulegioides* (L.) Pers. American Pennyroyal.
 620456.
- §*Melissa officinalis* L. Lemon Balm.
- Clinopodium vulgare* L. Basil.
Satureja vulgaris (L.) Fritsch.
- Koellia virginiana* (L.) MacM. Mountain Mint.
Pycnanthemum virginianum (L.) Durand and Jackson.
 620474—Wet meadow above Cumminsville. 620475—Dry surface of Ludlow's
 prairie bog. 620476—(Designated as "*Pyc. lanceolatum* var. *angustifolium*" in
 letter of June 3/40, from Torrey.)
- Koellia flexuosa* (Walt.) MacM. Narrow-leaved Mountain Mint.
- Pycnanthemum flexuosum* (Walt.) BSP.
- Koellia pilosa* (Nutt.) Britton. Hairy Mountain Mint.
Pycnanthemum pilosum Nutt.
 620477—Acclivity of gravel and sandy ridge, roadside beyond the turnpike
 gate near the Little Miami. 620478—Clarkson's woods near the fence, edge of
 the field.
- Lycopus virginicus* L. Buglewort.
 620463. 620464—Border of rivulet deep ravine three mi. NW.
- Lycopus americanus* Muhl. Cut-leaved Water Hoarhound.
 620461. 620462—Mill creek bottom towards Ludlow's.

- §*Mentha spicata* L. Spearmint.
620468—Banklick dam.
- §*Mentha piperita* L. Peppermint.
620467.
- §*Mentha citrata* Ehrh. Bergamot Mint.
- §*Mentha longifolia* (L.) Huds. Horse Mint.
- §*Mentha alopecuroides* Hull. Woolly Mint.
- Mentha arvensis* L. Corn Mint.
- Mentha canadensis* L. American Wild Mint.
Mentha arvensis var. *canadensis* (L.) Briquet.
620466—Banklick. (Kenton Co., Ky.)
- §*Mentha gentilis* L. Creeping or Downy Whorled Mint.
- Collinsonia canadensis* L. Citronella. Horse-balm.
620453—Banklick. (Kenton Co., Ky.) 620454.
- §*Perilla frutescens* (L.) Britton. Perilla.
- Solanaceae*
- §*Physalodes physalodes* (L.) Britton. Apple-of-Peru.
Nicandra Physalodes (L.) Pers.
- Physalis pubescens* L. Low Hairy Ground Cherry.
- Physalis angulata* L. Cut-leaved Ground Cherry.
- Physalis subglabrata* Mackenzie & Bush. Smooth Ground Cherry.
620493—Border of Clarkson's woods.
- Physalis heterophylla* Nees. Clammy Ground Cherry.
620494—Banklick. (Kenton Co., Ky.)
- Solanum nigrum* L. Black Nightshade.
- Solanum carolinense* L. Horse Nettle.
620495—River banks.
- §*Solanum rostratum* Dunal. Buffalo Bur.
- §*Solanum sisymbriifolium* Lam. Viscid Nightshade. (Reported by O. T. Wilson.)
- §*Solanum Dulcamara* L. Climbing Nightshade.
- §*Lycium halimifolium* Mill. Matrimony Vine.
Lycium vulgare (Ait.f.) Dunal.
- §*Datura Stramonium* L. Jimson-weed.
Datura Tatula L.
Both purple and green stemmed races are found.
- Scrophulariaceae**
- §*Verbascum Thapsus* L. Great Mullen.
- §*Verbascum Blattaria* L. Moth Mullen.
620516.
- §*Kickxia spuria* (L.) Dumort. Round-leaved Toadflax.
Linaria spuria (L.) Mill.
- §*Kickxia Elatine* (L.) Dumort. Sharp-pointed Toadflax.
Linaria Elatine (L.) Mill.
- §*Chaenorhinum minus* (L.) Lange. Small Snap-dragon.
Linaria minor (L.) Desf.
- §*Linaria vulgaris* Hill. Butter and Eggs.
Linaria Linaria (L.) Karst.

* Determinations in Scrophulariaceae by F. W. Pennell.

Scrophularia marylandica L. Maryland Figwort.

620513.

Chelone glabra L. Turtlehead.

620497.

Chelone glabra elongata Pennell & Wherry.

Pentstemon hirsutus (L.) Willd. Hairy Beard-tongue.

Pentstemon pallidus Small. Pale Beard-tongue.

Pentstemon Digitalis Nutt. Foxglove Beard-tongue.

Pentstemon laevigatus var. *Digitalis* (Sweet) Gray.

Pentstemon tubiflorus Nutt. Funnel-form Beard-tongue.

Pentstemon calycosus Small. Long-sepaled Beard-tongue.

620511. 620512—Clarkson's near the canal.

Pentstemon grandiflorus Nutt. Large-flowered Beard-tongue.

Collinsia verna Nutt. Blue-eyed Mary.

620498.

Mimulus ringens L. Square-stemmed Monkey-flower.

620508—Inundated and shaded border of Langdon's corn field, Little Miami.

Mimulus alatus Soland. Sharp-winged Monkey-flower.

620507—Ohio shore.

Leucospora multifida (Michx.) Nutt.

Conoclea multifida (Michx.) Benth.

620496—River shore.

Gratiola neglecta Torr.

620501—Muddy place in road—Banklick. (Kenton Co., Ky.)

620503—River shore.

Gratiola virginiana L. Clammy Hedge-hyssop.

Ilysanthes dubia (L.) Barnhart. False Pimpernel.

620505—Ditch bank, old dam towards Armstrong's. 620506—River shore.

Ilysanthes dubia major (Pursh.)

Veronica glandifera Pennell.

Veronica catenata glandulosa (Farwell) Pennell. Water Speedwell.

(Referred to as *Veronica Anagallis-aquatica* L.)

620517—Ditches, Ludlow's.

Veronica officinalis L. Common Speedwell.

Veronica serpyllifolia L. Thyme-leaved Speedwell.

620521—Wet bank below Taylor's dam. 620522—Grassy hillside east of reservoir. 620523—Woods, damp. 620524—Moist hillside. 620525—Corn field beyond Burnet's woods.

Veronica peregrina L. Purslane Speedwell.

620520.

§*Veronica arvensis* L. Corn Speedwell.

620518—Sandy bank, spring, Riddle's. 620519.

§*Veronica polita* Fries. Smooth Speedwell.

§*Veronica hederacifolia* L. Ivy-leaved Speedwell.

Veronicastrum virginicum (L.) Farwell. Culver's-root.

Leptandra virginica (L.) Nutt.

Veronica virginica L.

620504.

Dasistoma macrophylla (Nutt.) Raf. Mullen Foxglove.

Azelia macrophylla (Nutt.) Kuntze.

Seymeria macrophylla Nutt.

620514—Hills. 3½ NW. 620515—Boty. hill.

†*Aureolaria flava macrantha* Pennell. (Dasystema)

620499—Woods, 3½ north.

Agalinis tenuifolia (Vahl.) Raf. Slender Gerardia.

Gerardia tenuifolia Vahl.

Agalinis tenuifolia macrophylla (Benth.) Blake.

Agalinis Besseyana Britton.

Gerardia tenuifolia macrophylla Benth.

620500—4 mi. north. One specimen approaching *A. tenuifolia* Vahl. (F.W.P.)

Pedicularis lanceolata Michx. Swamp Lousewort.

†*Pedicularis canadensis* L. Wood Betony.

620509—Hills over Banklick. (Kenton Co., Ky.) 620510.

Lentibulariaceae

†*Utricularia gibba* L. (Clark catalog, 1852.)

†*Utricularia minor* L. Lesser Bladderwort.

620530—Mill creek pond.

Orobanchaceae

Thalesia uniflora (L.) Britton. Pale or Naked Broom-rape.

Orobanche uniflora L.

620528—Ludlow's. 620529—Ravine near Banklick. (Kenton Co., Ky.)

Conopholis americana (L.) Wallr. Squaw-root. Cancer-root.

620729—Hills over Banklick. 620730—Chillicothe. (Riddle).

Leptamnium virginianum (L.) Raf. Beech-drops.

Epifagus virginiana (L.) Bart.

620527.

Bignoniaceae

Bignonia radicans L. Trumpet-flower.

Tecoma radicans (L.) Juss.

620526.

§*Catalpa Catalpa* (L.) Karst.

Catalpa bignonioides Walt.

Catalpa speciosa Warder.

Martyniaceae

Martynia louisiana Mill. Unicorn-plant.

620532.

Acanthaceae

Ruellia strepens L.

620534.

Ruellia ciliosa Pursh.

Dianthera americana L. Water Willow.

620533—Little Miami.

Phrymaceae

Phryma leptostachya L. Lopseed.

620535—Woods.

Plantaginaceae

Plantago major L. Common Plantain.

620537.

Plantago Rugelii Dene. Pale Plantain.

620538—Hills, Ludlow's.

§*Plantago lanceolata* L. Ribwort. Lance-leaved Plantain.

620536—Clover field—about ½ mile from turnpike gate on Lebanon road.

Plantago aristata Michx. Large-bracted Plantain.

Plantago virginica L. Dwarf Plantain.

§*Plantago arenaria* W. & K. Sand Plantain. (Reported by O. T. Wilson.)

Rubiaceae

Houstonia coerulea L. Bluets.

620548—Wet woods about seven miles on the Madison road.

Houstonia lanceolata (Poir.) Britton. (Det. by F. W. Pennell.)

Houstonia purpurea calycosa A. Gray.

620552—Woods.

Houstonia purpurea L. Large Houstonia.

Houstonia ciliolata Torr. Fringed Houstonia.

620551—Dry hills four miles north of Cincinnati.

Houstonia longifolia Gaertn. Long-leaved Houstonia.

620550—Hills four miles north.

Cephalanthus occidentalis L. Buttonbush.

620539—Wet.

Cephalanthus occidentalis var. *pubescens* Raf.

Mitchella repens L. Partridge-berry. Twin-berry.

620553—Wet woods about seven miles on Madison road.

Spermacoce glabra Michx. Smooth Buttonweed.

620549—Stone's hill.

Diodia teres Walt. Rough Buttonweed.

§*Galium verum* L. Yellow Bedstraw.

Galium Aparine L. Cleavers.

620540—Woods.

Galium circaezans Michx. Wild Liquorice. Cross Cleavers.

620541.

Galium triflorum Michx. Fragrant Bedstraw.

620546, 620547—Field side.

Galium Mollugo L. Wild Madder. (Reported by O. T. Wilson.)

Galium tinctorium L. Stiff Marsh Bedstraw.

620542—Wet woods on the Madison road.

†*Galium Claytoni* Michx.

620545—Ludlow's swamp.

Galium concinnum Torr. & Gray. Shining Bedstraw.

620543—Clarkson's woods. 620544.

Caprifoliaceae

Sambucus canadensis L. Elder.

Viburnum acerifolium L. Maple-leaved Arrow-wood.

Viburnum pubescens var. *indianense* Rehder. Arrow-wood. (Fide E. J. Palmer.)

Viburnum prunifolium L. Black Haw.

620559—Banklick.

Viburnum rufidulum Raf. Southern Black Haw.

620558—Woods, Stone's hill. (This specimen has been referred, by E. J. Palmer of the Arnold Arboretum, to *V. prunifolium*. It has, however, the characteristic rusty red winter buds and broad petioles of *V. rufidulum*. The amount of brown tomentum on the petioles varies greatly; this specimen does not have the red tomentose petioles more generally seen.)

Triosteum aurantiacum Bicknell. Scarlet-fruited Horse-Gentian.

620557—Stone's hill.

(F.W.P.)

y.)

road.

Triosteum angustifolium L. Yellow or Narrow-leaved Horse-Gentian.

620556—Hills over Banklick. (Kenton Co., Ky.)

Symphoricarpos *Symphoricarpos* (L.) MacM. Coral-berry.

Symphoricarpos orbiculatus Hook.

620554—Banklick. (Kenton Co., Ky.) 620555—near Big-bone. (Boone Co., Ky.)

Lonicera dioica L. Glaucous Honeysuckle.

Lonicera sempervirens L. Coral Honeysuckle.

§*Lonicera japonica* Thunb. Japanese Honeysuckle.

Valerianaceae

Valeriana pauciflora Michx.

620564—Back of Barnard's.

§*Valerianella Locusta* (L.) Bettke. European Corn Salad.

Valerianella radiata (L.) Dufr. Beaked Corn Salad.

620561—Wet place below bank along Ludlow's middle field. Upper end of Este's bog close by the springs. 620562—In the boggy place at Ludlow's below the Laurel oak spring.

†*Valerianella Woodsiana* (T. & G.) Walp.

620560—Riddle's field near the pond. 620563—"June 12/43—I have compared the fruit of these with spms. of *F. umbilicata* received from Sullivant and find in mine the sterile cells somewhat more inflated and larger in proportion to the fertile cell. The spms. received from him marked *Fedia* ———? (supposed to be new) has fruit a little larger than in mine with the sterile cells flatter shallower and more spread out. I think mine are intermediate between the two, and that the three are but the one species." (T. G. Lea)

Both of these species of Sullivant's are now included as varieties or forms in *V. Woodsiana*.

Dipsacaceae

§*Dipsacus sylvestris* Huds. Teasel.

Cucurbitaceae

§*Cucurbita Pepo* L. Pumpkin.

§*Cucumis Melo* L. Muskmelon.

§*Citrullus vulgaris* Schrad. Watermelon.

Micrampelis lobata (Michx.) Greene. Wild Balsam-Apple.

Echinocystis lobata (Michx.) T. & G.

Sicyos angulatus L.

620565—Ludlow's.

Campanulaceae

§*Campanula rapunculoides* L. European Bellflower.

Campanula aparinoides Pursh. Marsh or Bedstraw Bellflower.

620568—Ludlow's bog and Saw mill bog.

Campanula americana L. Tall Bellflower.

620566.

Specularia perfoliata (L.) DC. Venus's Looking Glass.

620567.

Lobeliaceae

Lobelia cardinalis L. Cardinal-flower. Red Lobelia.

620569—Banklick (Kenton Co., Ky.)

Lobelia syphilitica L. Great Lobelia.

620573.

Lobelia leptostachys A. DC. Spiked Lobelia.

620572—Hills three miles NW.

620571—(rare) Clarkson's open woods. The specimen is accompanied by a detailed description, ending with the note: "The sagittate base of the calyx segments is not noticed in any of the books, and may entitle this to rank as a new species if not as the type of a sub-genus."

The species was described in 1839, two years after this note was written (July 26, 1837). The plant is included in Lea's catalog as *Lobelia spicata* and appears thus in all subsequent catalogs.*Lobelia inflata* L. Indian tobacco.

620570.

Cichoriaceae

§*Cichorium Intybus* L. Chicory.§*Cichorium Intybus divaricatum* DC.*Cynthia virginica* (L.) D. Don. False Dandelion.*Adopogon virginicum* (L.) Kuntze.*Krigia amplexicaulis* Nutt.

620613—Clarkson's woods. 620654—Hills, 4 miles north.

§*Picris hieracioides* L. Hawkweed *Picris*.§*Picris echioides* L. Bristly Ox-tongue.§*Tragopogon pratensis* L. Yellow Goat's-beard.§*Tragopogon porrifolius* L. Oyster Plant.§*Leontodon Taraxacum* L. Dandelion.*Taraxacum Taraxacum* (L.) Karst.*Taraxacum officinale* Weber.§*Leontodon erythrospermum* (Andrz.) Britton. Red-seeded Dandelion.*Taraxacum erythrospermum* Andrz.§*Sonchus arvensis* L. Corn Sow Thistle.§*Sonchus oleraceus* L. Hare's lettuce.§*Sonchus asper* (L.) Hill. Spiny Sow Thistle.§*Lactuca virosa* L. Prickly lettuce.*Lactuca Scariola* L.

620655—In stable lot.

§*Lactuca saligna* L. Willow Lettuce.*Lactuca canadensis* L. Wild Lettuce.*Lactuca sagittifolia* Ell. Arrow-leaved Lettuce.*Lactuca villosa* Jacq. Hairy-veined Blue Lettuce.*Lactuca floridana* (L.) Gaertn. Blue Lettuce.*Lactuca spicata* (Lam.) Hitch. Tall Blue Lettuce.

620657—Ravine back of Wallace's house. (Kenton Co., Ky.)

(This specimen is the form sometimes referred to as var. *integrifolia* Britton.)*Crepis runcinata* (James) T. & G. Naked Stemmed Hawksbeard.§*Crepis capillaris* (L.) Wallr. Smooth Hawksbeard.*Crepis virens* L.*Hieracium paniculatum* L. Panicked Hawkweed.

620651—Four miles north.

Hieracium scabrum Michx. Rough Hawkweed.

620652—Clarkson's open woods.

Hieracium Gronovii L. Hairy Hawkweed.

620650—Clarkson's open woods.

Nabulus altissimus (L.) Hook. Tall White Lettuce.

Prenanthes altissima L.

620659—Clarkson's woods. 620660.

Nabulus albus (L.) Hook. Rattlesnake-root.

Prenanthes alba L.

620658—Clarkson's woods and the small woods next.

Nabulus crepidineus (Michx.) DC. Corymbd Rattlesnake-root.

Prenanthes crepidinea Michx.

620661—Ludlow's meadow.

Ambrosiaceae

Ambrosia trifida L. Great Ragweed. Horse-weed.

Ambrosia trifida var. *integrifolia* (Muhl.) T. & G.

Ambrosia elatior L.

Ambrosia artemisiifolia L.

620578—On this specimen is the note: "'not distinct I think from artemisiifolia' Torr. lett. 3/40"

It is interesting to note that the above synonymy was recognized by Torrey as early as 1840, and has not appeared in our manuals until 1913.

§*Xanthium spinosum* L. Spiny Clobur. (James catalog, 1879; Lloyd catalog, 1891.)

Xanthium pennsylvanicum Wallr. Cocklebur.

(Referred to as *Xanthium canadense* Mill.)

620694—Dry old field, west of Williamson's house on the Licking. (Kenton Co., Ky.)

Xanthium commune Britton.

Xanthium americanum Walt.

(Referred to as *Xanthium strumarium* L.)

620695—Field back of Wallace's. (Kenton Co., Ky.)

Compositae

Vernonia altissima Nutt. Tall Ironweed.

620693.

Vernonia fasciculata Michx.

Elephantopus carolinianus Willd. Elephant's-foot.

Eupatorium maculatum L. Spotted Joe-Pye Weed.

Eupatorium purpureum var. *maculatum* (L.) Darl.

Eupatorium purpureum L. Joe-Pye Weed.

620625—Hills 3½ north. 620628—Woods. 620626—Clarkson's woods.

This specimen seems to be intermediate between *E. purpureum* and *E. maculatum*. Leaves decidedly pubescent beneath but not as rugose and thick as in *E. maculatum*. Inflorescence broad and rounded on top but not as pyramidal as in *E. purpureum*.

Eupatorium serotinum Michx. Late-flowering Thoroughwort.

Eupatorium altissimum L. Tall Thoroughwort.

Eupatorium sessilifolium L. Upland or Bastard Boneset.

620627—Hills 3½ north.

Eupatorium perfoliatum L. Boneset.

620624.

Eupatorium urticaefolium Reichard. White Snakeroot.

Eupatorium ageraioides L.f.

620623—Woods.

Eupatorium coelestinum L. Mist-flower.

620611.

Kuhnia eupatorioides L. False Boneset.

(Variable, some forms apparently referable to *K. glutinosa*.)

Grindelia squarrosa (Pursh) Dunal. Broad-leaved Gum-plant.

Solidago caesia L. Blue-stem Goldenrod. Wreath Goldenrod.

620678—Banklick. (Kenton Co., Ky.)

Solidago flexicaulis L. Zig-zag Goldenrod. Broad-leaved Goldenrod.

Solidago latifolia L.

620681.

Solidago speciosa Nutt. Showy Goldenrod.

620689—Ludlow's middle thicket, under a large white oak.

(Now known in only one station in the region—on the Little Miami river.)

Solidago patula Muhl. Rough-leaved Goldenrod.

620686—Ludlow's meadow at Cummins ville. 620687—(Mill creek valley.)

Solidago ulmifolia Muhl. Elm-leaved Goldenrod.

620690—Clarkson's woods $3\frac{1}{2}$ NW. 620691. 620692—Ludlow's thicket.

"appear all to be varieties of our *S. ulmifolia* Darl. lett Sep. 29/38."

No. 620690 has the leaves unusually long for the species; plants with leaves like No. 620691 or shorter, are more usual here. All have the upper part of the stem and branches loosely pilose.

Solidago canadensis L.

620680—Orchard, bank of Ohio, Columbia.

Solidago serotina Ait. Late Goldenrod.

620682—Ludlow's bog, at the Laurel oak spring.

Solidago altissima L. Tall Goldenrod.

620679—Near Clarkson's woods. 620688—Taylor's meadow. (Kenton Co., Ky.)

(The commonest species around Cincinnati.)

Solidago nemoralis Ait. Gray Goldenrod. Dwarf Goldenrod.

620625—Ludlow's thicket, next to orchard spring.

Euthamia graminifolia (L.) Nutt. Flat-topped Goldenrod.

Solidago graminifolia (L.) Salisb.

620683—Field back of Bryant's.

620684—Taylor's meadow. (Kenton Co., Ky.)

Bellis perennis L. European Daisy.

ASTER—Specimens of *Aster* in writer's herbarium examined by Dr. F. W. Pennell and Mr. Bayard Long of the Academy of Natural Sciences.

The writer, however, assumes responsibility for this list.

Aster divaricatus L. White Wood Aster.

620630—Banklick. (Kenton Co., Ky.) (Fide F. W. Pennell.)

Aster Schreberi Nees.

620629—Banklick, moist rocky banks.

Aster macrophyllus L. Large-leaved Aster.

Aster Shortii Hook.

620593—Stone's hill.

Aster azureus Lindl.

620591—Upper corner of Clarkson's open woods.

Aster cordifolius L. Blue Wood Aster.

620580—Up the hill from Taylor's fern ravine. (Campbell Co., Ky.)

620681—Field, side of Levapour's orchard. (Kenton Co., Ky.)

620582—Ludlow's.

(Very variable in the region; Lea's three specimens differ in size and serration of leaves, and in form and density of inflorescence.)

Aster sagittifolius Willd. Arrow-leaved Aster.

620592. 620597—Ludlow's meadow.

- Aster phlogifolius* Muhl. Thin-leaved Purple Aster.
Aster patens var. *phlogifolius* Nees.
 620588—Field back of Bryant's.
- Aster novae-angliae* L. New England Aster.
 620584—Over Banklick, dry hillside. (Kenton Co., Ky.)
 620585—Dry hill over Banklick.
- Aster puniceus* L. Red-stalk Aster.
 620590—Ludlow's wet thicket.
- Aster prenanthoides* Muhl. Crooked-stem Aster.
 620589—Border of rivulet below Este's prairie.
- Aster laevis* L. Smooth Blue Aster.
- Aster lateriflorus* (L.) Britton. Calico Aster.
 620587—Thicket beyond Levapeur's. (Kenton Co., Ky.)
- Aster vimineus* Lam. Small White Aster.
- Aster salicifolius* Lam. Willow Aster.
- Aster paniculatus* Lam. Tall White Aster.
 620583—Riddle's field near the pond.
 620594—Levapeur's near mouth of rivulet on the bank. (Kenton Co., Ky.)
- Aster Tradescanti* L.
 620586—Ludlow's meadow. (This specimen possibly should be referred to *A. lateriflorus*)
 620595—Bank of rivulet, Taylor's meadow. (Kenton Co., Ky.)
 620596—Edge of rivulet, foot of bank—Taylor's meadow. (Kenton Co., Ky.)
- Aster ericoides* L. White Heath Aster. Frost-weed Aster.
- Erigeron pulchellus* Michx. Poor Robin's Plantain.
 620618—Hills, Este's bog.
- Erigeron philadelphicus* L. Fleabane.
 620620—Riddle's. 620621—Este's prairie, edge of ditches.
- Erigeron annuus* (L.) Pers. Daisy Fleabane.
 620617—Gardens. Roadside near Bryant's. 620622.
- Erigeron ramosus* (Walt.) B.S.P. Daisy Fleabane.
- Leptilon canadense* (L.) Britton. Canada Fleabane.
Erigeron canadensis L.
 620619.
- Leptilon divaricatum* (Michx.) Raf. Dwarf Fleabane.
Erigeron divaricatus Michx.
- Doellingeria umbellata* (Mill.) Nees. Tall Flat-top White Aster.
Aster umbellatus Mill.
- †*Pluchea petiolata* Cass. Inland Marsh Fleabane.
 620662—Banklick. (Kenton Co., Ky.)
- Antennaria Parlinii* Fernald. Cat'sfoot.
- Antennaria plantaginifolia* (L.) Richards. Plantain-leaf Everlasting.
 620631. 620632—Dry hills. 620633—Dry hills.
- Antennaria neglecta* Greene. Field Cat's-foot.
- Gnaphalium obtusifolium* L. Fragrant Life Everlasting.
Gnaphalium polycephalum Michx.
 620634.
- Gnaphalium uliginosum* L. Low Cudweed.
 620636—Ohio shore. 620637—River shore.
- Gnaphalium purpureum* L. Purplish Cudweed.
 620635—Dry hills four miles north.
- §*Inula Helenium* L. Elecampane.
 620653.

- Polymnia Uvedalia* L. Yellow Leaf-cup.
620664—Edge of woods, hillside over Banklick near Watson's house.
- Polymnia canadensis* L. Small-flowered Leaf-cup.
620663—Woods.
- Silphium perfoliatum* L. Cup-plant. Indian-cup.
620675.
- Silphium trifoliatum* L. Whorled Rosin-weed.
620677—Clarkson's woods.
- Silphium terebinthinaceum* Jacq. Prairie Dock.
620676—Bank near Ludlow's house.
- Heliopsis helianthoides* (L) Sweet. Ox-eye. False Sunflower.
620649—Hillside of ravine beyond Clarkson's.
- Verbesina alba* L. Yerba de tajo.
Eclipta alba (L.) Hassk.
620614—Banklick. (Kenton Co., Ky.) 620615.
- Rudbeckia triloba* L. Cone-flower.
620670—Hill over Banklick. (Kenton Co., Ky.)
- Rudbeckia hirta* L. Black Eyed Susan.
620665—Ludlow's 620666—Dry hills, four miles north.
- Rudbeckia speciosa* Wenderoth. Showy Cone-Flower.
620668—From J. Clark's garden. 620669—Ludlow's meadow and Este's bog.
- Rudbeckia Sullivantii* Boynton & Beadle. (Fide F. W. Pennell.)
Rudbeckia speciosa var. *Sullivantii* (Boynton & Beadle) Robn.
- Rudbeckia laciniata* L. Tall or Green-headed Cone-flower.
- Ratibida pinnata* (Vent.) Barnhart.
Lepachys pinnata (Vent.) T. & G.
620656—Ludlow's. 620667—Bank near Ludlow's house.
- Helianthus annuus* L. Common Sunflower.
- Helianthus microcephalus* T. & G. Small Wood Sunflower.
620647—Clarkson's open woods.
- Helianthus giganteus* L. Tall Wild Sunflower.
620644—Dry borders of prairie bog, near Mr. B.
- Helianthus Maximiliana* Schrad.
- Helianthus grosse-serratus* Martens. Saw-tooth Sunflower.
620645—Ludlow's wet thicket, near where the *Cypripedium* grows.
- Helianthus divaricatus* L. Woodland Sunflower.
620640—Clarkson's woods. 620641—Hills $3\frac{1}{2}$ north. 620639—Clarkson's open woods.
Nos. 620640, 620641, 620639, 620646 form a series, of which the first is *H. divaricatus*, and the last *H. hirsutus*. Nos. 620641 and 620639 have more numerous heads and less strongly divaricate leaves than *H. divaricatus*, and stem slightly scabrous. All the specimens are from the same locality, and it seems entirely possible that the intermediate forms may be the result of hybridization.
- Helianthus decapetalus* L. Thin-leaved Wild Sunflower.
620642—Edge of Correy's clover field. 620643.
- Helianthus trachelifolius* Mill. Throatwort Sunflower.
- Helianthus strumosus* L. Pale-leaved Wood Sunflower.
620648—Dry knoll in Williamson's field (Kenton Co., Ky.)
- Helianthus hirsutus* Raf. Stiff-haired Sunflower.
620646—Clarkson's woods.
- Helianthus tuberosus* L. Jerusalem Artichoke.

Ridan alternifolius (L.) Britton. Wing-stem. Yellow Ironweed.

Verbesina alternifolia (L.) Britton.

Actinomeris alternifolia (L.) DC.

620577.

Phaethusa helianthoides (Michx.) Britton.

Verbesina helianthoides Michx.

620575—Field next Clarkson's woods. 620576—Field, 3½ north.

†*Coreopsis tripteris* L. Tall Tickseed.

620612—Clarkson's open woods, but a single plant, and the first time it has been found in our vicinity.

Not uncommon in the counties east, but no longer found in our region.

The disk flowers are dark brown even before expanding, not "turning brownish" as Gray's manual states.

Coreopsis tinctoria Nutt. Golden Coreopsis. Garden Tickseed.

Bidens laevis (L.) B.S.P. Larger Bur-marigold. Brook Sunflower.

620599. 620600—Wet.

No specimens of *Bidens laevis* from the vicinity of Cincinnati agree completely with that species. All have some characters of *Bidens cernua*. That *B. laevis* as now recognized is more southern in its range than *B. cernua*, though the ranges of the two overlap, and the intermediate character of all specimens from this region, may indicate that *B. cernua* is a northern segregate, and only specifically distinct at its more extreme geographic limits.

Bidens connata Muhl. Purple-stemmed Swamp Beggar-ticks.

620601.

Bidens comosa (A. Gray) Wiegand. Leafy-bracted Tickseed.

620604—Cumminsville meadow. 620605—Meadow, Banklick. (Kenton Co., Ky.)

Bidens frondosa L. Beggar-ticks.

620603.

Bidens vulgata Greene. Tall Beggar-ticks.

620602.

Bidens bipinnata L. Spanish Needles.

620598.

Bidens trichosperma (Michx.) Britton. Tall Tickseed Sunflower.

Bidens trichosperma var. *tenuiloba* (Gray) Britton.

Bidens aristosa (Michx.) Britton. Western Tickseed Sunflower.

§*Galinisoga parviflora* Cav. Peruvian Daisy.

Helenium autumnale L. False or Swamp Sunflower.

620638.

Helenium nudiflorum Nutt. Purple-head Sneezeweed.

Helenium tenuifolium Nutt. Fine-leaved Sneezeweed.

Boebera papposa (Vent.) Rydb. Fetid Marigold.

Dyssodia papposa (Vent.) Hitchc.

Achillea Millefolium L. Yarrow.

620574—Fields.

§*Anthemis Cotula* L. Mayweed. Fetid Camomile.

§*Anthemis arvensis* L. Field Camomile.

§*Chrysanthemum Leucanthemum* L. Ox-eye Daisy.

§*Chrysanthemum Parthenium* (L.) Pers. Common Feverfew.

§*Chrysanthemum Balsamita* L. Costmary.

§*Matricaria inodora* L. Scentless Camomile. Corn Mayweed.

§*Matricaria matricarioides* (Less.) Porter. Wild Marigold.

Matricaria suaveolens (Pursh) Buchenau.

§*Tanacetum vulgare* L. Tansy.

Artemisia annua L. Annual Wormwood.

Artemisia biennis Willd. Wormwood.

620579—On the river bank, Kentucky, about half way down between Pleasant run and Cullum's riffles.

§*Artemisia vulgaris* L. Common Mugwort.

Erechtites hieracifolia (L.) Raf. Fireweed.

Mesadenia reniformis (Muhl.) Raf. Great Indian Plantain.

Cacalia reniformis Muhl.

620606—Hillside, Este's prairie.

This specimen is not glabrous; lower leaves finely and sparsely pubescent on both surfaces; upper leaves pubescent on veins beneath; all leaves finely and closely ciliate in sinuses between all teeth. The amount of pubescence on plants of this region varies, but the ciliate patches between the teeth seem to be constant.

Mesadenia atriplicifolia (L.) Raf. Pale Indian Plantain.

Cacalia atriplicifolia L.

Synosma suaveolens (L.) Raf. Sweet-scented Indian Plantain.

Cacalia suaveolens L.

620607—Ohio shore, a mile or more below Ludlow's. 620608—Ludlow's.

In our region, this is not a plant of woods, but of swamps.

§*Senecio vulgaris* L. Groundsel.

Senecio aureus L. Golden Ragwort. Swamp Squaw-weed.

620671—Swamps, Ludlow's. 620672—Ludlow's springy bog.

620673—Border of rivulet, Riddle's meadow.

Senecio obovatus Muhl. Round-leaf Squaw-weed. Groundsel.

620674.

§*Arctium Lappa* L. Burdock.

§*Cirsium lanceolatum* (L.) Hill. Common Bur or Spear Thistle.

Carduus lanceolatus L.

Cirsium altissimum (L.) Spreng. Tall Thistle.

Carduus altissimus L.

620609—West of Longworth's vineyard.

Cirsium discolor (Muhl.) Spreng. Field Thistle.

Carduus discolor (Muhl.) Nutt.

†*Cirsium muticum* Michx. Swamp Thistle.

Carduus muticus (Michx.) Pers.

620610—Ludlow's meadow swamp.

§*Cirsium arvense* (L.) Scop. Canada Thistle.

Carduus arvensis (L.) Robs.

§*Onopordon Acanthium* L. Cotton Thistle. Scotch Thistle.

§*Centaurea Cyanus* L. Ragged Sailor. Corn Flower.

§*Centaurea Jacea* var. *lacera* Koch. Brown Knapweed.

§*Centaurea rochinensis* Bernh. Tyrol Knapweed.

§*Centaurea maculosa* Lam. Spotted Knapweed.

§*Centaurea solstitialis* L. Barnaby's Thistle.

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Correction: p. 23, l. 38 read "typhina."

ACER SACCHARUM AGAIN

HOMER D. HOUSE

There have recently appeared some comments regarding the correct name of the eastern Sugar maple, commonly called *Acer saccharum* Marshall. Mr. Mackenzie (Rhodora 28: 111-112; 233-234. 1926) gives quite clearly his reasons for rejecting the name and Bush (Am. Midl. Nat. 12: 499-503. 1931) proposes for it a new name, *Acer Treleaseanum*.

Mr. Mackenzie seems to place undue reliance upon the introductory paragraph of Marshall's *Arbustum Americanum*, which he quotes. If Marshall intended to merely enumerate the Linnaean species of maples in eastern America he certainly made a mess of the subject and on is forced to the conclusion, here as well as in certain other of his genera, that Marshall knew his trees better than he did their Linnaean names.

Marshall lists six species of maple (not four as indicated by Bush). Let us see what they are:

1. *Acer pennsylvanicum* (page 2). This is *Acer spicatum* Lam. and is well described.
2. *Acer glaucum* (page 2). This is the "Silver-leaved Maple" as Marshall calls it (*Acer saccharinum* Linn. as that name is now currently applied). The description and common name given leaves no doubt as to its application.
3. *Acer Negundo* (page 2).
4. *Acer canadense* (page 3). Marshall designates this as the "American Striped Maple," and it the *Acer pennsylvanicum* Linn., at least as that name is now applied.
5. *Acer rubrum* (page 3). Designated by Marshall as the "Scarlet flowering Maple."
6. *Acer saccharum* (page 4). This Marshall designates as "The Sugar Maple," in spite of the fact that we are led to infer from what Mackenzie and Bush say that Marshall did not describe any Sugar maple. Marshall then goes on to state that "the leaves something resemble the Silver-leaved Maple, but are not so large, nor deeply lobed; or of so fine a silver colour. It flowers in manner of the Scarlet Maple, but the flowers are of an herbaceous colour; and produces large joined winged seeds. The back inhabitants make a pretty good sugar, and in considerable quantity, of the sap of this and the Silver-leaved Maple"—

Admittedly there is much to be desired in this as a description of our Sugar maple, but (and this is an important point to be remembered in a consideration of Marshall's maples) he misapplied intentionally or otherwise the name *Acer pennsylvanicum*, he described the Striped Maple as a new species, *Acer canadense* and he unmistakably described the Silver-leaved maple as *Acer glaucum*. Then what, may I ask, did he intend the name *saccharum* to stand for if not for the Sugar maple, as he designates it? In the light of an entire review of Marshall's genus *Acer* can Mr. Mackenzie or anyone else say certainly that the name was a misspelling of *saccharinum*? The fact that the French translator changed the spelling is not to my mind conclusive evidence. It might however be worth consideration if Marshall had neglected to describe the Silver-leaved maple as *Acer glaucum*. Perhaps Marshall did intend to use the name as spelled by Linnaeus (*saccharinum*). If he had done so it would still have been his (Marshall's) Sugar Maple and the name would have been a homonym. However faulty the description may be the fact remains that this is the earliest application of a specific name to the Sugar maple. It is quite inconceivable that Marshall did not know the Sugar maple and it is also inconceivable that he should not have attempted to designate it under some name in his *Arbustum Americanum*. The name *saccharum* is highly appropriate and has been widely adopted. Only Marshall knows whether *saccharum* was the deliberate naming of a tree well known to him, or the misspelling of an earlier name misapplied to the tree under consideration, and Humphrey Marshall is not here to tell us which it was.

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FAECAL PELLETS OF SOME MARINE INVERTEBRATES

ELTON R. EDGE

This paper deals with the general appearance and size of faecal pellets of a number of marine invertebrate animals. Moore (1931) has pointed out the geological value of a knowledge of faecal pellets and it is with its possible use to paleontologists in identifying similar pellets that this paper is concerned. Moore already has published material of this nature, but it is believed these notes do not duplicate his work. The material was worked up in connection with the determination of digestive rates in the animals represented. No attempt was made to work out the internal structure of the pellets with reference to the presence or nature of internal canals such as Moore (1932b) has done. Careful attention, however, was given to shape, size, sculpturing, and gross

ANNULATA

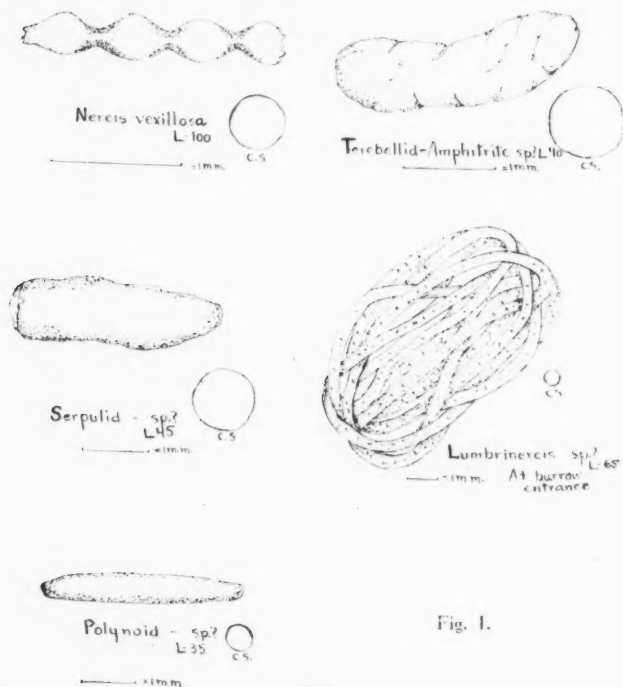


Fig. 1.

diagnostic characteristics, and all drawings were made to scale generally by use of a camera lucida and a stage micrometer. The pellets in most cases represent the droppings from animals that had just been collected from their normal habitat in or near Balboa Bay, California, during 1933.

Several facts dealing with the variation in pellets should be pointed out. It was noted in many cases that not only the amount but also the kind of food in the intestine at the time the pellet was formed influenced its shape. It was also found that the size of the animal had a direct influence on the size of the pellet and for this reason the length of the animal in mm. is given following the scientific name on the drawings. Since it was not found practicable to make all drawings to the same scale, a separate mm. scale has been indicated on each drawing.

In the annelid group the most conspicuous faecal material comes from

MOLLUSCA

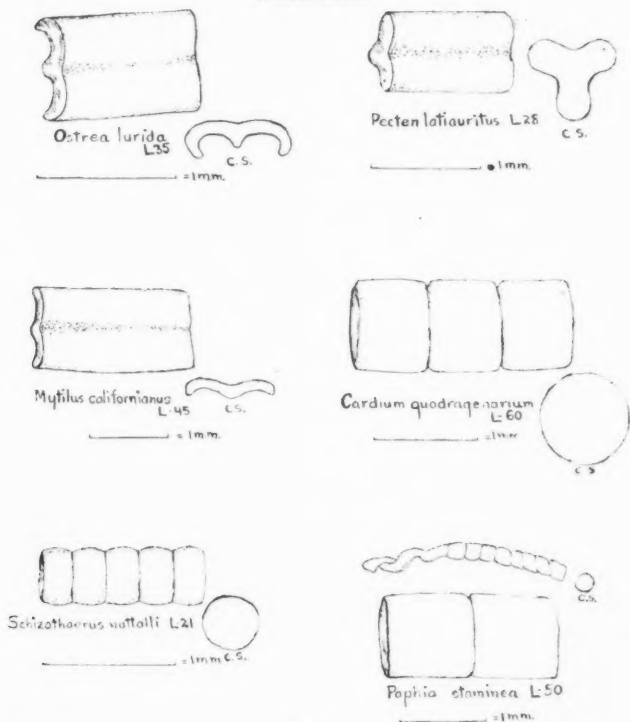


Fig. 2.

MOLLUSCA

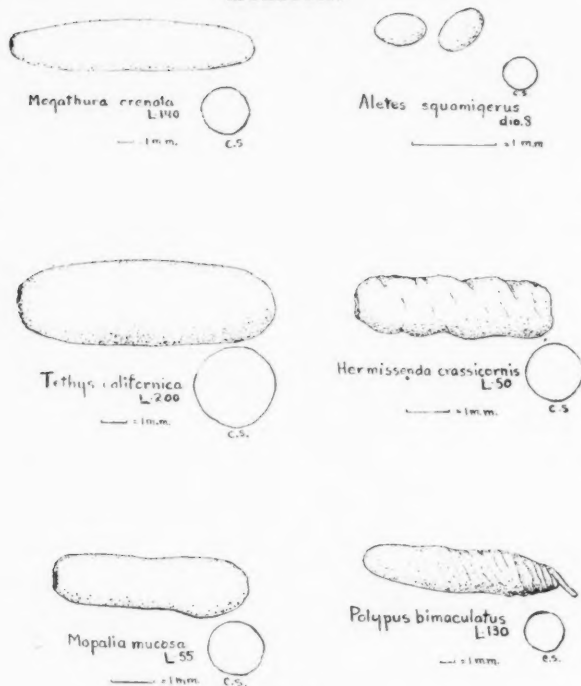


Fig. 3.

feeders like *Lumbrinereis*, which engulfs fine sand and mud and selectively digests out the nutritive material, leaving piles of the undigestible portions at its burrow entrance. A definite segmentation appeared in the faeces of *Nereis*, due evidently to the collection of undigested material in greater mass in the intestine between septa. It seemed possible, (but was not demonstrated satisfactorily), that the segmentation would have been less marked if the worm had been active during most of the time. In the case of the other annelids considered the pellets were not particularly characteristic, being made up of mucus and bits of indigestible materials.

Molluscan faecal pellets showed a number of characteristic differences. In cross section, the ribbonlike faeces of the oyster and mussel showed marked longitudinal groves and ridges; similar sculpturing also appeared on the pellets of certain of the gastropods like *Norissia* and *Tegula*. The cross section of the pectan pellet was trilobed. The faeces of clamlike forms such as *Paphia*, *Schizothaerus* and *Cardium* showed a definite linear segmentation.

MOLLUSCA

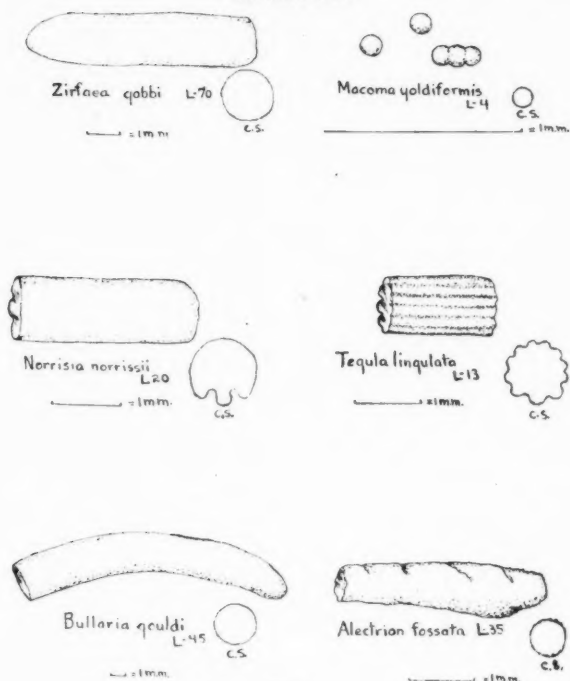


Fig. 4.

In the case of *Macoma*, the segmentation at times was replaced by separate spherical pellets. The tube mollusc *Aletes* also had small separate pellets of an elliptical form. The sea hare, *Tethys*, may have separate elongated pellets but in many cases they are sections of a continuous rod like excretion. The same may be said of the chiton *Mopalia*. The keyhole limpet *Megathura* rasps off such food as encrusting algae and bryozoa along with fine sand and gritty material so that the faeces at times are made up of rather coarse particles. The octopus, *Polypus*, gives off a compact pellet which often seems to be made up of a continuous thread of mucus and undigested material. The nudibranch, *Hermisenda*, when feeding on clam remains, also gives off a compact pellet made up of a twisted continuous thread-like structure.

The faecal pellets of arthropoda do not show very marked characteristic differences in gross structure. In general, they are rod-like, of varying lengths, with a definite circular cross section except in the case of the isopod *Ligyda* which in cross section appears to be a double rod. Moore (1932b), however,

ARTHROPODA

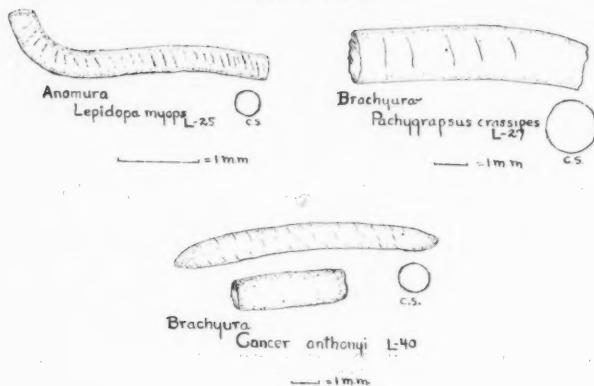


Fig. 5.

has pointed out that under favorable conditions many of the arthropod pellets under magnification will show in their cross sections internal canals which are of diagnostic value.

The pellets of the echinoderms in general seem to be rather irregular. The starfish, *Asterina*, and the brittle star *Ophioderma* show at times compacted pellets made up of a string-like mass. The omnivorous sea-urchin, *Lytechinus*, throws off pellets of varying size and shape, the more irregular shaped ones often being made up of coarse material such as sand, bits of kelp, bryozoan plates and the like. The large sea cucumber, *Stichopus*, gives off regular rod-shaped pellets of varying lengths, which usually contain a large amount of fine sand.

The faecal pellet of the tunicate, *Ciona*, is quite characteristic resembling small shavings, the length is variable. The tunicate, *Styella*, seems to be less selective in its feeding than *Ciona*, for its pellets generally contain much more material of an indigestible nature, like clay, than do those of *Ciona*. One other chordate might be mentioned, i. e., *Dolichoglossus*, for in certain localities on the mud flats numerous little piles of its droppings are to be found resembling those of *Lumbrinereis* except that the earthy material taken in by *Dolichoglossus* is in a more finely divided condition.

Grateful acknowledgment is made for the research facilities provided by

the William G. Kerckhoff Marine Laboratory at Corona del Mar, California, and for assistance and advice received from its director Professor G. E. MacGinitie.

This paper is to be considered the first of a series, because it is hoped that further work can be done on faecal pellets, as well as tracks and burrows of marine animals.

ARTHROPODA

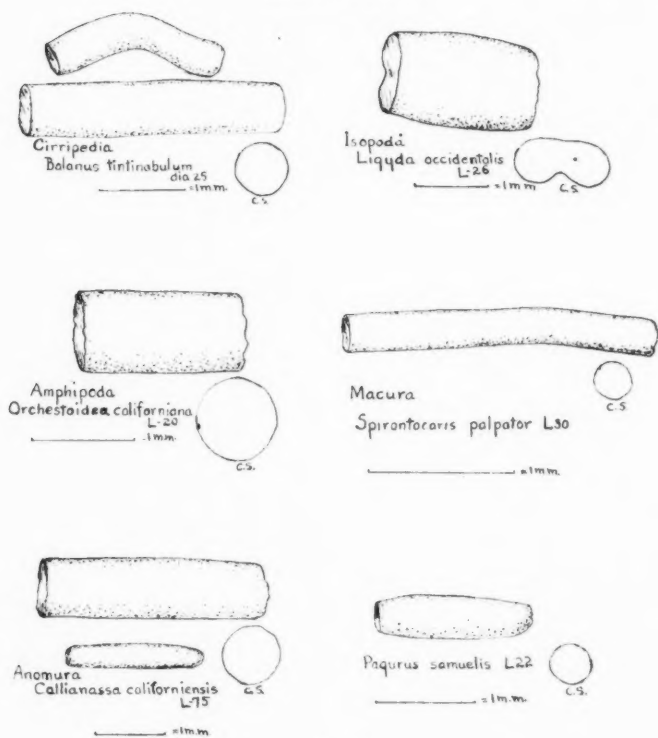
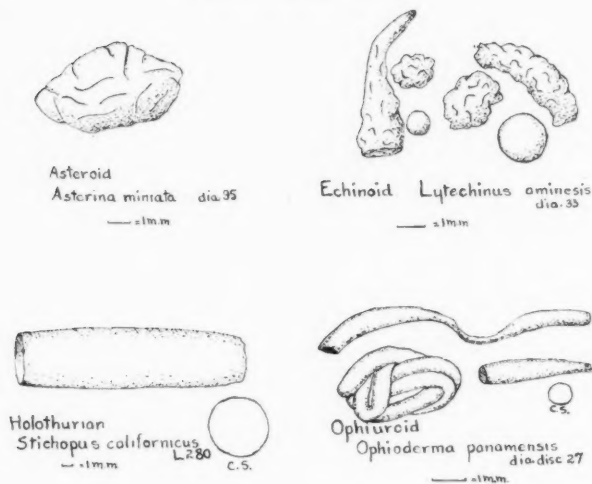


Fig. 6.

ECHINODERMATA



TUNICATA

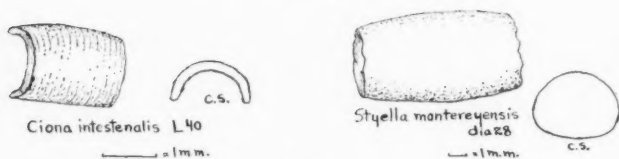


Fig. 7.

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A LIST OF THE MOLLUSKS OF THE DISTRICT OF COLUMBIA AND VICINITY

HORACE G. RICHARDS

As far as is known only two lists of the molluscan fauna of the District of Columbia have been published. Charles Girard (1855)¹ listed 90 species and in 1885 C. Lehnert² published a list of 136 species and varieties in the *Pastime*, a periodical devoted largely to the natural history of the region around the city of Washington. The number containing the list appears to be the last issue published by the periodical. This second list was rediscovered by McAtee (1932)³ in an article on the contents of the various numbers of the *Pastime*. This periodical is extremely rare, and the only known copy containing the list is in the library of the Division of Birds in the United States National Museum in Washington.

While connected with the United States National Museum in 1931 and 1932, I became interested in the molluscan fauna of the District and made a number of collections in the region. Because of the scarcity of the published lists and because of the many changes in nomenclature since their publication, it appeared advisable to publish a new list of the mollusks of the District and vicinity.

Lehnert gave considerable material to both the Academy of Natural Sciences of Philadelphia and the National Museum at Washington which is therefore available for study. The accompanying list is a modernization of Lehnert's list with corrections and additions based largely upon the collections of the Academy of Natural Sciences of Philadelphia which I have been permitted to consult. A few records based upon the collections of the National Museum and upon material collected by the writer are added.

The area covered by this list is approximately the same as that used by Clark (1932)⁴ in his work on the Butterflies of the District of Columbia and Vicinity. It includes the District of Columbia and portions of Maryland and Virginia within a radius of 20 miles from the Capitol Building in the city of Washington, thus taking in portions of Alexandria and Fairfax Counties, Virginia, and Prince Georges and Montgomery Counties, Maryland. In a few cases records from slightly more distant points are included (with this fact indicated) where it is highly probable that the species could also be found within the limits of the District of Columbia.

The fall line or boundary between the Piedmont region and the Coastal Plain passes through the District of Columbia. However the region has

1 *Proc. Nat. Inst.*, vol. 1 no. 2, pp. 78-82.

2 *Pastime*, vol. 3, no. 8, pp. 5-8.

3 *Proc. Biol. Soc. Wash.* vol. 45, pp. 23-28.

4 *Bull. U. S. Nat. Mus.*, no. 157.

more affinities with the Coastal Plain than with the Piedmont, for according to Clark, (1932, p. 17) "in the District the Coastal Plain is represented by a long and relatively narrow, northwesterly extension into the Piedmont, which forms the lower portion of the valley of the Potomac."

Only 30 miles up the Potomac northwest from Washington the land begins to rise into the eastern ridges of the Appalachians.

The accompanying faunal list of the mollusks of the District of Columbia region contains nothing unusually striking. It is about what one would expect in the Upper Austral (or Carolinian) zone at the boundary between the Coastal Plain and the Piedmont Plateau. Most of the species are of rather wide distribution and are similar to what one would find in the vicinity of Baltimore, Philadelphia or other cities in the region.

The proximity of the District to the Appalachians, in the Piedmont region, quite naturally accounts for the presence of a number of species of southern Appalachian affinities, which are numerous at such places as Natural Bridge, Va., Culpeper, Va., Harper's Ferry, W. Va., and Cumberland, Md., and which have occasionally been reported from the District of Columbia region, more especially from the Virginia side of the Potomac. In this category belongs: *Zonitoides cerinoideus* Anth. *Z. demissus* (Binney), *Mesomphix cupreus* (Raf.), *Polygyra stenotrema* Fér., *P. tridentata edentilabris* Pils., *Somatogyrrus virginicus* Walker and *S. pennsylvanicus* Walker.

In addition to the species of southern Appalachian affinities, the Piedmont region, west of the District contains a number of northern or boreal species which extend southward along the mountains. This northern element is more striking in the case of the butterflies (Clark, 1932)⁵. *Ferrissia tarda* (Say) and *Retinella electrina* (Gould) may perhaps be classed in this group.

The accompanying list is probably far from complete. No doubt further collecting would yield additional species for the region, but it is hoped that the present list will serve as a working basis for collectors of the District of Columbia. Certain exotic species, obviously introduced in greenhouses, etc., such as *Subulina octona* Brug. and *Rumina decollata* L. are omitted from the list.

GASTROPODA

Helicidae

<i>Polygyra fraudulenta</i> Pils.	<i>Polygyra hirsuta nana</i> C. & A.
<i>Polygyra fallax</i> (Say)	(Culpeper, Va.)
<i>Polygyra denotata</i> (Fér.)	<i>Polygyra monodon fraterna</i> (Say)
<i>Polygyra thyroidus</i> (Say)	<i>Polygyra monodon aliciae</i> Pils.
<i>Polygyra thyroidus bucculenta</i> Gould	<i>Polygyra tridentata</i> Say
<i>Polygyra albolabris</i> (Say)	<i>Polygyra tridentata juxtidentis</i> Pils.
<i>Polygyra exoleta</i> (Say)	<i>Polygyra edentilabris</i> Pils.
<i>Polygyra stenotrema</i> (Fér.)	<i>Helix nemoralis</i> L. (introduced, Lexington,
<i>Polygyra hirsuta</i> (Say)	Va., Staunton, Va., Washington, D.C.
<i>Polygyra monodon</i> (Rack)	

⁵ loc. cit. pp. 17-18.

Zonitidae

- | | |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <i>Cupypa sterkii</i> (Dall) | <i>Hawaia minuscula</i> (Binney) |
| <i>Euconulus chersinus dentatus</i> (Sterki) | <i>Striatura meridionalis</i> (Pils.) |
| <i>Euconulus chersinus polygyratus</i> (Pils.) | <i>Zonitoides arboreus</i> (Say) |
| <i>Euconulus fulvus</i> (Müller) | <i>Zonitoides limatulus</i> (Ward) (recorded from D.C. in U.S.N.M. collections) |
| <i>Retinella rhoadsi</i> (Pils.) (Rock Run, Susquehanna River, Md.) | <i>Zonitoides nitidus</i> (Müller) (Baltimore, Md.) |
| <i>Retinella electrina</i> (Gould) | <i>Zonitoides ligerus</i> (Say) |
| <i>Retinella indentata</i> (Say) | <i>Zonitoides suppressus</i> (Say) |
| <i>Retinella burringtoni</i> (Pils.) | <i>Zonitoides demissus</i> (Binney) |
| <i>Mesomphix cupreus</i> (Raf.) | <i>Zonitoides cerinoideus</i> (Anth.) (recorded from D.C. in U.S.N.M. collections) |
| <i>Oxychilus lucidum</i> (Drap.) | |
| <i>Oxychilus cellarium</i> (Müller) | |
| <i>Oxychilus altiarium</i> (Müller) | |

Endodontidae

- | | |
|-------------------------------------------------|-----------------------------------|
| <i>Anguispira alternata</i> (Say) and varieties | <i>Discus patulus</i> (Desh.) |
| <i>Helicodiscus parallelus</i> (Say) | <i>Punctum vitreum</i> H.B.B. |
| <i>Helicodiscus singleyanus inermis</i> H.B.B. | <i>Punctum minutissimum</i> (Lea) |
| <i>Discus cronkhitei anthonyi</i> (Pils.) | |

Haplotrematidae

Haplotrema concavum (Say)

Pupillidae

- | | |
|-------------------------------------|------------------------------------------|
| <i>Gastrocopta procerca</i> (Gould) | <i>Vertigo pygmaea</i> Drap. |
| <i>Gastrocopta armifera</i> (Say) | <i>Vertigo milium</i> Gould |
| <i>Gastrocopta contracta</i> (Say) | <i>Vertigo gouldii</i> Binney |
| <i>Gastrocopta corticaria</i> (Say) | <i>Pupoides marginatus</i> (Say) |
| <i>Gastrocopta pentodon</i> (Say) | <i>Gastrocopta tappaniana</i> (C.B. Ad.) |
| <i>Vertigo ovala</i> Say | |

Strobilopsidae

- | | |
|--------------------------------------|----------------------------------------------------------|
| <i>Strobilops aenea</i> Pils. | <i>Strobilops affinis</i> Pils. (Fairfax, Va., U.S.N.M.) |
| <i>Strobilops labyrinthica</i> (Say) | |

Valloniidae

- | | |
|------------------------------------|-------------------------------------|
| <i>Vallonia pulchella</i> (Müller) | <i>Vallonia excentrica</i> (Sterki) |
|------------------------------------|-------------------------------------|

Cochliocopidae

Cochliocopa lubrica (Müller)

Auriculidae

- | | |
|--------------------------------|----------------------------|
| <i>Carychium exiguum</i> (Say) | <i>Carychium exile</i> Lea |
|--------------------------------|----------------------------|

Limacidae

- | | |
|-------------------------|-------------------------------------|
| <i>Limax maximus</i> L. | <i>Deroceras agreste</i> (L.) |
| <i>Limax flavus</i> L. | <i>Deroceras campestre</i> (Binney) |

Lymnaeidae

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <i>Lymnaea columella</i> Say | <i>Lymnaea caperata umbilicata</i> Ad. (recorded from D.C. in U.S.N.M. collections) |
| <i>Lymnaea columella macrostoma</i> Say (recorded from D.C. in U.S.N.M. collections) | <i>Lymnaea obrussa</i> Say |
| <i>Lymnaea caperata</i> Say | <i>Lymnaea humilis</i> Say |

Planorbidae

- | | |
|------------------------------------------|-----------------------------------|
| <i>Helisoma trivolvis</i> (Say) | <i>Cyraulus deflectus</i> (Say) |
| <i>Helisoma antrosom</i> (Conrad) | <i>Cyraulus dilatatus</i> (Gould) |
| <i>Cyraulus parvus</i> (Say) | <i>Menetus exacuus</i> (Say) |
| <i>Cyraulus parvus walkeri</i> (Vanatta) | <i>Planorbula armigera</i> (Say) |

Anyclidae

- Ferrissia rivularis* (Say) *Ferrissia fusca* (Ad.)
Ferrissia kirklandi (Walker) *Ferrissia tarda* (Say) (Lexington, Va.)
Ferrissia diaphana (Hald.)

Physidae

- Physa heterostrophia* (Say) *Physa gyrina* (Say) (recorded from D.C.
Physa ancillaria Say in U.S.N.M. collections)

Pleuroceridae

- Goniobasis virginica* (Gmel.) *Anculosa carinata* (Brug.)
and varieties

Amnicolidae

- Amnicola limosa* (Say) *Somatogyrus* (Cillia) *atilis* (Lea)
Amnicola limosa porata (Say) *Lyogyrus granum* (Say)
Amnicola pallida Hald. *Lyogyrus pupoides* (Gould)
Amnicola lustrica Pils. *Lyogyrus lehneri* Ancey (type locality,
Cincinnati) *Washington, D.C.)*⁶
Somatogyrus virginicus Walker *Pomatiopsis lapidaria* (Say)
Somatogyrus pennsylvanicus Walker *Bulimus tentaculatus* (L.)
(Harpers Ferry, W. Va.)

Valvatidae

- Valvata bicarinata* Lea *Valvata tricarinata* (Say)

Viviparidae

- Campeloma decisum* (Say) *Viviparius viviparus* Lea (recorded from
Campeloma rufum (Hald.) D.C. in U.S.N.M. collections)
Viviparus contectoides W. G. Binney *Lioplax subcarinatus* (Say)

PELECYPODA

Sphaeriidae

- Sphaerium slamineum* (Conrad) *Pisidium virginicum* (Gmel.)
Sphaerium solidulum (Prime) *Pisidium crucialum* Sterki
Sphaerium modestum Prime *Pisidium compressum* Prime
Sphaerium occidentale (Prime) *Pisidium abditum* Hald.
Sphaerium striatinum (Lam.) *Pisidium punctatum* Sterki
Musculium secure (Prime) and varieties *Pisidium trapezoideum* Sterki
Musculium partumeium (Say) *Pisidium walkeri* Sterki
Musculium truncatum (Lins.) *Pisidium fraudulentum* Sterki
Musculium transversum (Say)

Unionidae

- Lampsilis cariosus* (Say) *Strophitus undulatus* (Say)
Lampsilis radiatus (Gmel.) *Alasmidonta undulata* (Say)
Lampsilis ocraceus (Say) *Alasmidonta heterodon* (Lea)
Lampsilis ventricosa *cohongoronta* Ortm. *Alasmidonta marginata* (Say)
(U.S.N.M.) *Elliptio complanatus* (Sol.)
Lampsilis nasutus (Say) *Elliptio productus* (Conrad)
Anodonta cataracta Say

6 Conch. Exch. vol. 2, pp. 79-80 (1887).

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THE SYSTEMATIC STATUS OF ELEUTHERODACTYLUS LATRANS (COPE)*

JEAN PIATT

The generic affinities of *Eleutherodactylus latrans* have remained a subject of controversy to herpetologists since the time of its appearance. The species was originally described by Cope (1878, p. 186) as *Lithodytes latrans*, a typical *nomen nudum*, and two years later (1880, p. 25) received a formal description by him. Cope did not state in this latter paper his reasons for including *latrans* in the genus *Lithodytes* but in a later work (1889, p. 315) makes the assertion that the sole difference between *Lithodytes* and *Eleutherodactylus* (= *Hylodes* of authors) consists in the smooth belly of the former while the latter is granular or areolated. The integumental character of the belly is obviously without ground and both types occur freely in *Eleutherodactylus*. Fitzinger (1843, p. 31) originated the genus *Lithodytes* giving *lineatus* as the genotype but characteristically failed to append a definition so that it is impossible to know his reasons for separating *lineatus* from *Eleutherodactylus*. It remained for Peracca (1904, p. 31) to give the first clear cut diagnosis of the genus *Lithodytes*. He examined a specimen of *lineatus*, and noting the difference in the sternum from that of *Eleutherodactylus*, concluded that *lineatus* was intermediate between *Leptodactylus* and *Eleutherodactylus* and revived the genus *Lithodytes* to include the single species, *lineatus*. Mocquard (1899, p. 159) has considered *Eleutherodactylus latrans* as identical with *E. augusti* (Duges), but Kellogg (1932, p. 101) after an extensive study of the Mexican Salientia concludes that the forms though closely related warrant specific allocation. Kellogg (1932, p. 104) further examined one of the cotypes of *E. latrans* in the United States National Museum and found that the presence of T-shaped terminal phalanges and the form and cartilaginous character of the sternal elements allied this species, at least on these grounds, with *Eleutherodactylus*. Noble (1925, p. 14) offers the suggestion that because of the discrepancies in the breeding habits of *latrans* and the appearance of the toes the species does not belong to the genus *Eleutherodactylus*. Recently, Dunn (1931, p. 387), described a new species of Central American frog under the name of *Lithodytes gaigei* basing his addition to the genus upon the *Leptodactylus*-like shoulder girdle and the presence of T-shaped terminal phalanges.

The type of *L. gaigei* (M. C. Z. No. 10011), together with the substantiation of an additional specimen of this species, the dissection of specimens of *Eleutherodactylus* and *Leptodactylus* in the Philadelphia Academy of Natural Sciences, and a specimen of *L. lineatus* (M. C. Z. No. 6033) furnish the material upon which are based the following conclusions.

Twenty-one species of *Eleutherodactylus* were examined in regard to the

* The author wishes to acknowledge his indebtedness to Dr. E. R. Dunn, without whose help this work would not have been possible.

character of the omosternum, sternum, terminal phalanges, and the presence or absence of the grooves on the tip of the digits. From this material there were found to be three pattern-types of omosterna and three of sterna, the types of one showing absolutely no correlation with those of the other. Both omosternum and sternum were cartilaginous in all cases with a tendency for sporadic calcification. The terminal phalanges were found to range from strongly T-shaped to very weakly T-shaped or knobbed. The grooves on the end of the digits were reduced or absent in two species. The following is a tabulary summary of the above:

Omosternum Type 1	-----	5 species	Terminal Phalanges T-shaped	16 species
Omosternum Type 2	-----	9 species	Terminal Phalanges --	
Omosternum Type 3	-----	7 species	not T-shaped	5 species
Sternum Type 1	-----	2 species	Grooves Present	19 species
Sternum Type 2	-----	17 species	Grooves not Present	2 species
Sternum Type 3	-----	2 species		

Thirteen species of *Leptodactylus* were examined with reference to the same four factors. The omosterna were all of one definite type, a narrow style with an abruptly expanded terminal plate, and wholly cartilaginous, very similar to what I have called Type 3 in *Eleutherodactylus*. The sterna were of two types, but differed less from each other than did those of *Eleutherodactylus*. The style was osseous in all cases. The terminal phalanges were simple, or nearly so, on all species examined. There were no indications of digital grooves. The two types of sterna were about equally divided, six for one and seven for the other.

The type of *Lithodytes gaigei* was found to possess distinct T-shaped terminal phalanges, digital grooves, and the omosternum and sternum agreed exactly with what I have called omosternum Type 2 and sternum Type 2 in *Eleutherodactylus*. The other specimen of *L. gaigei* agreed in every detail with the type.

Examination of the *L. lineatus* revealed the presence of distinct ossification in both omosternum and sternum, T-shaped terminal phalanges, and grooves on the tip of the digits, thus agreeing with the species as outlined above by Peracca.

Lastly, examination of two cotypes of *Eleutherodactylus latrans* (A. N. S. P. No's. 10757-58) proved them to be exactly similar in sternal elements and terminal phalanges to the typical *Eleutherodactylus*, and hence *gaigei*, but they differed in the absence of digital grooves. Unlike *Eleutherodactylus*, however, the skin of the head adhered firmly to the skull.

The results, then, based upon the material set forth above, would seem to warrant the following conclusions:

1. The extensive variation in the characters employed in this paper in *Eleutherodactylus* would indicate that the genus is at the zenith of specialization, and that therefore a morphological diagnosis of the group must take this fact into consideration and make allowance for the concomitant wide fluctuation.

2. The converse is obtained in *Leptodactylus* where variation is minimized. The genus *Leptodactylus* is relatively less plastic and therefore will not permit the inclusion of forms widely divergent from one another.

3. The omosternum and sternum of *Lithodytes gaigei* is entirely cartilaginous and hence, adhering to the definition of *Lithodytes* set forth by Peracca, cannot be used to exemplify that genus. Hence the fact that *Eleutherodactylus latrans* compares in all but the digital grooves with *Lithodytes gaigei* does not necessarily relegate the former to the latter genus.

4. The sternal elements and character of the terminal phalanges of *Eleutherodactylus latrans* agree absolutely with those exemplified by the majority of *Eleutherodactylus* species examined.

5. The grooves on the terminal extremities of the digits is not a constant character in *Eleutherodactylus* as evidenced by their absence in *E. weinlandi* and *E. pulcher* (= *Leptodactylus pulcher* of authors). The nature of this character is not therefore of sufficient import to exclude *E. latrans* from the genus.

6. The radical difference in the breeding habits of *E. latrans*, i. e. laying of eggs in water and indirect aquatic development of tadpoles, is the only valid character in which it differs from *Eleutherodactylus*. This probably is a direct adaptation to the exigencies of the environment and, in view of its physiological rather than anatomical character, and in recollection of conclusion 1, this discrepancy does not seem sufficient for generic definition.

7. *Eleutherodactylus latrans* must remain in the genus *Eleutherodactylus*.

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TAPIRUS HAYSII OF OKLAHOMA

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The tapir to be described here is one of four that have been found in this state. It was collected at Chickasha, Oklahoma from a Pleistocene gravel pit about twelve feet below the surface. The formation in which it occurred rests unconformably upon the Permian. The fossil is of importance in that it is the best specimen of this group that has been found in the state, and it adds considerably to our knowledge of *Tapirus haysii* in Oklahoma. It consists of the palate with complete promolars and molars, except for the anterior half of the right third molar which has been broken off and lost. The canines and incisors are missing, but their alveolae clearly show their relative sizes and positions. The specimen is well mineralized and in an excellent state of preservation. A ventral view of this palate is shown in figure 1.



Fig. 1.—Palate of *Tapirus haysii* from Chickasha, Oklahoma. Length 258 mm.

The first tapir reported from this state came from Logan County, and was mentioned briefly with a number of other Pleistocene forms by E. L. Troxell¹ in 1917. In 1930, Hay and Cook² reported the right ramus of *Tapirus haysii* from the gravel pit at Frederick, Oklahoma. In this specimen there were two milk molars and their successors which were uncut. The first true molar was also present. In 1929, Mr. Holloman found, in the Frederick gravel pit, the second upper molar of *Tapirus haysii*, which was identified by the senior author.

General characters of the fossil: Depth of jaw at base of third premolar 35 mm.; length of deastem 50 mm.; width of rostrum midway of deastem

1. TROXELL, E. L. An Oklahoma Pleistocene fauna. Bull. Geol. Soc. Amer., vol. 28, 1917, p. 212.

49 mm.; depth at this point 40 mm.; width of palate between second molars 66 mm.; width of post-palatal notch 40 mm.; length of palate from base of incisors to postpalatal notch 200 mm.; estimated breadth of skull at second molar 189 mm.

Dental formula, upper jaw: I 3, P 4, M 3.

Dental measurements:

Teeth	P 1	P 2	P 3	P 4	M 1	M 2	M 3
Length -----	19mm.	19mm.	21mm.	22mm.	24mm.	27mm.	27mm.
Width -----	18mm.	24mm.	24mm.	29mm.	29mm.	31mm.	29mm.

Dental characters: The first premolar is triangular in shape. Premolars 2, 3, and 4 are molariform, the protoloph and metaloph being of about the same length. In the molars, however, the protoloph is larger than the metaloph, both of which are well developed. There is also a pronounced posterior and anterior cingulum on all except the first premolar. The para-style is not present in the first premolar, but shows up on the succeeding premolars and becomes progressively stronger through the third and fourth premolars and the first molar; on the second and third molar it is strong and of about equal development. In the first premolar the paracone is higher than the metacone but in the remaining premolars and molars they are of about equal height. Although the incisors and canines are not present, the alveolae of these teeth indicate that the canines were smaller than the third incisors which were the largest in the rostral series. The second incisor was small and the first was considerably larger than the second, but not nearly so large as the third.

Conclusion: This specimen is very similar to *Elasmognathus bairdii*,³ however, in this specimen the postpalatal notch seems to be deeper and broader than in *E. bairdii*. Close comparison with the type specimen of *Tapirus haysii californicus*⁴ is rendered difficult because it is represented only by the second lower molar. The Oklahoma specimen, however, is a large mature animal and on the basis of the characters that have been described it is identified as *Tapirus haysii*.

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BOOK REVIEWS

FORAMINIFERA, THEIR CLASSIFICATION AND ECONOMIC USE (Second Edition), and AN ILLUSTRATED KEY TO THE GENERA OF THE FORAMINIFERA, by Joseph A. Cushman. Special Publications Nos. 4 and 5, Cushman Laboratory for Foraminiferal Research, Sharon, Mass., 1933. 349 pp. \$5.00 in U. S. A., \$6.00 in foreign countries; Key alone, \$2.00 in U. S. A., \$2.50 in foreign countries.

Students familiar with the first edition of Cushman's "Foraminifera, their Classification and Economic Use," will welcome the second edition. It not only brings our knowledge of the foraminifera up-to-date, including descriptions and figures of new genera described as late as the middle of 1933, but is, in many other respects, an improvement over the original work. All figures except those of the illustrated family-trees, and the keys to the families and genera are published in a small supplementary volume, "An Illustrated Key to the Genera of the Foraminifera." This arrangement, according to the author, is for the purpose facilitating reference to the plates, and eliminates the necessity of turning pages to find the plates, as in the first edition. The two volumes will be treated as a unit in this review.

The book is planned primarily as a guide for taxonomic paleontologists, but the inclusion of the general, and in some cases, elementary material of the first ten chapters, indicates that it is also intended to serve as a text book. It is the writers opinion that the book should have been devoted entirely to taxonomy, by complete elimination of the preliminary chapters, or that these chapters should have been greatly expanded. The information presented is already familiar to students sufficiently advanced to employ the book as a guide to taxonomy, and the treatment is too brief to be of much value to beginners.

The first chapter describes the habitat, habits and method of reproduction of foraminifera. The phenomenon of alternation of generations is described in some detail, and is illustrated by several excellent, new figures.

This is followed by the longest, and to the teacher, the most helpful of the introductory chapters. This chapter describes the materials employed in the construction of the test, and variations in the form of the test, the arrangement of the chambers, the form and position of the aperture, and ornamentation, and illustrates all of these features with four plates of excellent figures not included in the first edition. In this chapter the author presents evidence to substantiate his theory that the most primitive foraminiferal test is chitinous in composition, and that from the chitinous were developed the arenaceous-shelled foraminifera, and from these, in turn, the calcareous and occasional siliceous-shelled forms. He mentions several genera which recapitulate this evolutionary history during the life of a single individual, beginning life with a test of chitin, to which grains of sand or other fragments are cemented, and later developing a wholly calcareous test. In discussing the arenaceous test, he describes and illustrates the remarkable selective power exhibited by many of the foraminifera in choosing certain special types of clasts, such as sponge-spicules or mica-flakes for the construction of the test.

The third chapter outlines methods of collecting, washing, sorting and storing samples. This chapter deals principally with the methods of collecting and preparing Recent material, and devotes relatively little attention to the treatment of fossil material, in spite of the fact that the book is obviously intended primarily for paleontologists rather than biologists.

This chapter is logically followed by one on methods of study, which contains valuable suggestions for examining of samples, picking and mounting of specimens and the preparation of various types of slides and slide trays for storing mounted specimens. The last half of the chapter deals with methods of measuring specimens of foraminifera, and of preparing illustrations for publication or for card-cataloguing. The

author could have saved space in his book, and perhaps considerable time for readers who may experiment with the apparatus and technique he describes for photographing foraminifera, by substituting for his elaborate discussion the simple statement that photography as a method of illustrating microfossils is a failure. It is noteworthy that Dr. Cushman employs drawings almost exclusively in his own papers.

The fifth chapter, on "Economic Use," describes the use of foraminifera in the correlation of subsurface strata in well sections, and contains numerous suggestions for the cataloguing of specimens and the charting of their stratigraphic ranges which have been found practical and helpful in the laboratories of several oil companies.

The sixth chapter is devoted to a description of the geographic distribution of foraminifera. Some interesting information regarding the modern distribution of the foraminifera and the Tertiary migrations which account for this distribution are briefly presented. This chapter could have been made much more useful to paleontologists interested in ascertaining the ecological conditions under which their specimens lived by giving more generous lists of the families and genera commonly found in warm and cold, and in shallow and deep waters. The author's extensive collections from all parts of the world, and more than thirty years of study have undoubtedly supplied him with a much richer store of information on this interesting and important phase of study than is indicated here.

In the seventh chapter the author describes the geologic distribution of the foraminifera. The first two pages he devotes to a discussion of pre-Carboniferous foraminifera, including the numerous reported occurrences of calcareous-shelled genera in pre-Cambrian and in early Paleozoic rocks. He states that some of the supposed foraminifera are microscopic concretions, that others were described from internal casts of the shell, making it impossible to determine the true nature of the wall of the test, and that still others are of doubtful origin, but do not suggest foraminifera. The author then calls attention to the recently developed method of dissolving lime-stones, which has resulted in the discovery of beautifully preserved arenaceous foraminifera in rocks of early Paleozoic age, and states that as late as the Carboniferous "arenaceous forms almost completely predominate." These facts and conclusions he presents in support of his view that the arenaceous foraminifera are more primitive than the calcareous, and the unbiased reader will find the evidence presented here very convincing. In the latter part of the chapter the author briefly describes the foraminiferal faunas of each of the geologic periods, beginning with the Carboniferous. In discussing each period he names the dominant families and genera, and any important families or genera which make their first appearance or become extinct during that period.

The next chapter, discussing Hofker's theory of Trimorphism, could have been more logically and advantageously included as a part of the first chapter, following the discussion of the phenomenon of alternation of generations in the life history of the foraminifera.

In the ninth chapter, the author discusses the principles of classification, insisting on a phylogenetic classification, in contrast to the purely morphological classifications of many earlier students, describes briefly the methods of determining the phylogenetic relationships of foraminifera which are often strikingly dissimilar in appearance and arrangement of chambers in the adult, and outlines the evolutionary trends exhibited by some of the important families. This chapter contains some new information not included in the chapter on classification in the first edition.

The tenth chapter, on "Research Problems Concerning the Foraminifera," is entirely new, and is, in itself, sufficient to recommend the book. It mentions numerous unexplored or little explored fields of investigation which will present attractive problems to students of the future. The list of suggestions includes problems in paleontology, classification and phylogeny, physiology, and ecology.

The taxonomic portion of the book begins with page 61. The author recognizes 47 families and 528 valid genera. A full page chart shows in graphic form the phylogenetic relationships of the families of the foraminifera, as conceived by the author.

Under each family name the author gives a brief description of the family characters, and an outline of the evolution of the family. Most of the families are divided into two or more subfamilies. The characters of each subfamily are summarized in turn, and under each are descriptions of the included genera.

Under each generic name are listed references to figures of the genus, both in the large volume and in the Key, the genotype, a complete reference to the original description of the genus, and the more important synonyms. This is followed by a summary of the generic characters, a brief statement of the known geologic range, and in the case of genera represented by living species, the habitat. The value of these generic descriptions could have been greatly increased by including a statement as to the geologic age and type locality of the genotype, and by complete references to the original descriptions of genera regarded as synonyms.

Drawings of the genera of each family are arranged, with but few exceptions, in phylogenetic trees which indicates the relationships of the various genera. These family trees are the same as those published in the first edition, except that genera described since 1928 have been added. In a few of the families the relationships of the genera are somewhat obscure, and while these genera are illustrated, there is no attempt to arrange them in phylogenetic sequence. The number of these families has been greatly reduced, however, since the publication of the first edition. The phylogenetic trees and other illustrations occupy 22 plates. The species selected to illustrate the generic characters is in most cases the genotype, and in many cases, the figures accompanying the original description of the species are used.

Keys to the families, subfamilies and genera of the foraminifera are contained in the supplementary volume mentioned above. This smaller volume also contains 40 plates illustrating from one to several species of most of the genera. Usually both fossil and Recent species are figured, if the genus in question is represented by known fossil and living forms. A few genera illustrated in the Key are not figured in the larger volume. The figures contained in the illustrated Key are, in the writer's opinion, the best that have been published for the purpose of illustrating the generic characters of foraminifera. The descriptions of the plates include references to the text of the larger volume.

Cushman's classification of the foraminifera is, in the light of present knowledge, probably the best that has been presented. Most of the phylogenetic trees appear logically arranged, although differences in interpretation would permit minor rearrangements in some cases. A number of paleontologists will also disagree with the family assignment of a few of the genera, and many will feel the need for the recognition of several additional genera in the family Lageniidae, especially.

Following the systematic descriptions, there is an enlarged bibliography, including references to papers published as late as the middle of 1933. The bibliography is arranged as in the first edition. Taxonomic or faunal papers are grouped, first, according to the geologic age of the genera and species described, under the headings Recent, Tertiary, Cretaceous, Jurassic, Triassic, and Paleozoic, and under these headings are arranged by geographic areas. After the taxonomic papers are listed papers on miscellaneous topics, under the headings Morphology and Technique, The Living Animal, Classification and General Nomenclature, and Bibliography.

The bibliography is followed by an index to the families, subfamilies and genera, in which the valid names and synonyms are differentiated by differences in the type. The index gives not only the page reference in the text, but also references to figures of the genus, both in the large volume and in the Key.

It is to be regretted that the first ten chapters of this book were not rewritten and enlarged sufficiently to make it usable as a text book of micropaleontology. In spite of the brevity of treatment of general topics, the text will at least serve as an outline or guide in planning supplementary lectures, and the new figures illustrating microspheric and megalospheric tests and other shell structures will be found extremely helpful to beginning students.

The book and supplementary Key are indispensable to the taxonomic paleontologist.—C. I. ALEXANDER.

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